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Screwworm Eradication Data System (SEDS)

Operation Manual

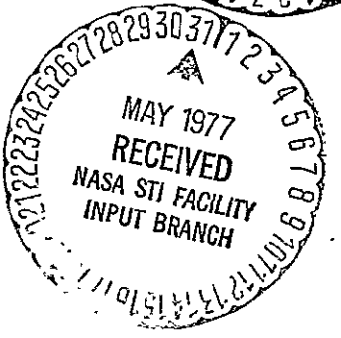
Contract NAS 9-1261

DRL LI 2.21

prepared for

National Aeronautics and Space Administration

Lyndon B. Johnson Space Center



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Prepared for

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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FOREWORD

This document is provided by the Space Information Systems Operation (SISO) in accordance with the requirements of Task Order (TO) P-6Q00 as established under modification No. 201 of Contract NAS 9-1261, Schedule V, and DRL Line Item 2.21.

Part IV of this document will be forthcoming under separate cover at a later date. It will deal with, SEDS program listings.

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SECTION 1

INTRODUCTION

1.1 PURPOSE

The purpose of this manual is to provide detailed operating instructions and definition of the Screwworm Eradication Data System (SEDS). It contains sections on all phases of SEDS operation as well as sections on utility routines, error messages, and system disk maintenance procedures. Display layouts and examples of runs are included as additional explanation to SEDS program procedures. In the process of preparing this manual, it was assumed that the operational personnel involved will have a knowledge of the PDP 11/45 and the Disk Operating System (DOS). This manual does not include procedures on powering up equipment or any of the hardware diagnostic routines.

SECTION 2

SEDS SYSTEM INITIALIZATION PROCEDURES

2.1 CONFIGURATION

The SEDS consists of the following equipment.

- SEDS production disk, configured as DK0
- Scratch disk, configured as DK1 with UIC(200,200) enabled
- VT05 display terminal. All operator inputs for the SEDS and system outputs are via the VT05
- DECwriter
- Bucode tape drives
- Interactive color display unit
- High speed line printer
- 14-track hardware.

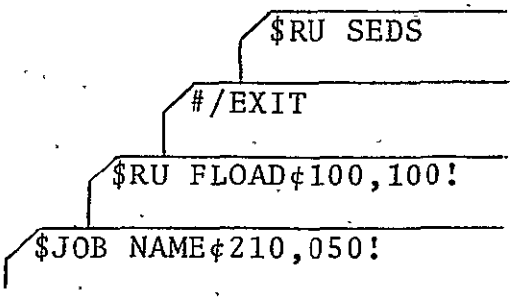
2.2 LOADING SEDS

To boot the system perform the following steps with the production disk on DK0, scratch disk on DK1 and write protect disabled on DK0.

- Depress the HALT switch
- Enter 773100 into the address register on the switch console and depress the LOAD ADDRESS switch
- Enter 77406 into the address register
- Enable the HALT switch by moving up from the down position
- Depress the START switch
- Enable WRITE PROTECT on DK0.

The DOS system is initialized and control is given to the DECwriter. Batch input cards are used to bring in the SEDS and output the SEDS initial display as follows.

A. Place the following card deck in the card reader with the RESET button depressed.



B. Key in BA_CR:, LP: on the DECwriter.

C. The batch input cards are read in and the SEDS is loaded from disk.

2.3 SEDS INITIAL DISPLAY INPUTS

The initial display inputs are as follows.

- The SEDS initial display is output to the VT05 screen (figure 2-1)
- When the cursor returns to the HOME position, the system is ready for operator control
- Enter today's date by hitting ALT key to position to input fields and keying in current date
- Hit HOME key to position to command line
- At the bottom of the initial display is a list of the programs that make up the SEDS (i.e., SEU, SRE, DPG, RAP, SSP, CDP). Key in the requested program call letters, followed by a CR, on the command line
- The program is now loaded into core from disk
- As a rule, after a program name is input, the VT05 screen will go blank, which will indicate control has been relinquished and passed to the requested program, and its corresponding display will be output.

```
DATE: 01-MAR-75

                    S C R E W W O R M

                    E R A D I C A T I O N

                    D A T A

                    S Y S T E M

PROGRAM CALL LETTERS    * * * * * * * * * * *    SYSTEM IDENTIFICATION

 SEU = SEDS EU CONVERSION                        SEDS PRODUCTON DISK
 SRE = SFDS REGISTRATION                         VERSION 01
 RAP = RAINFALL ALGORITHM PROGRAM                01-MAR-75
 SSP = SCREWWORM SURVIVAL PROGRAM
 CDP = CHARACTER DFNSITY PROGRAM
 DPG = DISPLAY & PRODUCT GFNFRATOR
```

Figure 2-1 SEDS Initial Display

SECTION 3

14-TRACK PROCESSING PROCEDURES

3.1 DESCRIPTION

The SEDS preprocessor is a software subsystem which formats data input from the National Oceanic and Atmospheric Administration (NOAA) supplied 14-track analog tapes for output to either the 525-line interactive color display or 9-track computer-compatible tape (CCT). Under normal conditions, the SEDS preprocessor is utilized in the following two-pass manner.

A. Screening Pass. This first pass outputs the raw data to the 525-line interactive color display. The operator controls the system from the display console and has the options of defining an area and tagging points within this area on the display. When the operator is satisfied with the viewed image and area defined, the run is terminated and the results of the run evaluated for intialization for the next pass.

B. Edit Pass. The second pass, following the screening of the data, formats and outputs the raw data for the area defined in the first pass to 9-track tape in universal format. The area delimiters determined in the screening pass are used to initialize this run.

3.2 ASSUMPTIONS AND GROUNDRULES

These SEDS preprocessor procedures contain the basic information required to prepare and run a SEDS preprocessor job on the PDP 11/45. In the preparation of this section, the following assumptions were made:

A. The personnel involved have a knowledge of the PDP 11/45 and the DOS.

B. The PDP 11/45 and required peripheral equipment are powered up and properly configured.

C. The 14-track drive and required interface hardware are properly set to play SEDS NOAA tapes.

3.3 OPERATOR INTERACTIVE FUNCTIONS

This paragraph discusses those functions for which the operator of the SEDS preprocessor is responsible. This includes the following:

- Job initialization (card inputs)
- Job control (VT05 and interactive display inputs)
- Job evaluation (real-time VT05 display interpretation).

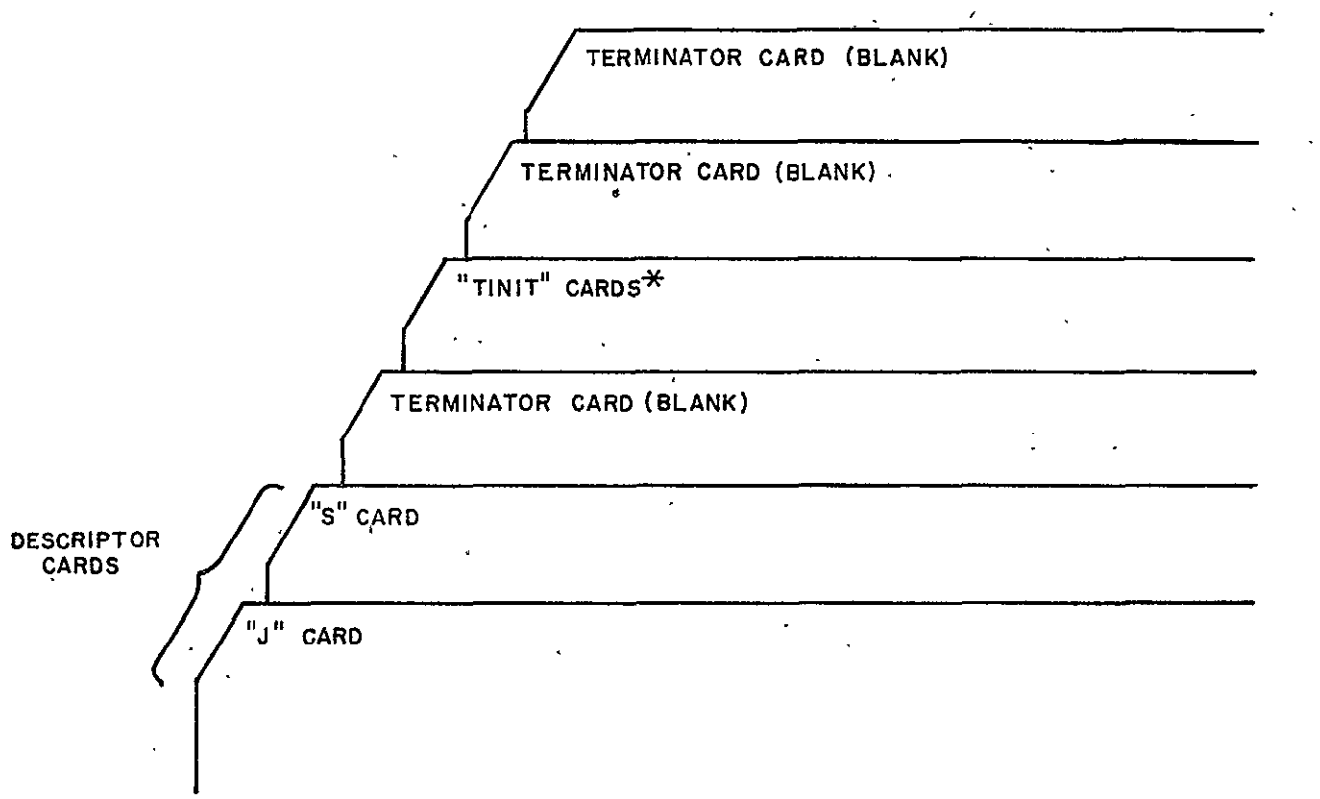
3.3.1 Card Inputs. Card inputs are used to initialize the SEDS preprocessor. These cards describe the job to be run relaying such information as type of run desired, data delimiters, NOAA tape description, output tape device, and other various annotation variables.

All card inputs for a particular job constitute a job card deck. The types of cards included in this deck are descriptor cards, TINIT cards, and terminator cards. The descriptor cards consist of the JOB and SEDS cards which contain system initialization parameters. The TINIT cards relay header annotation data and output tape device status. The terminator cards are simply blank cards. See figure 3-1 for correct sequencing of the job card deck.

3.3.1.1 Job Descriptor Cards. Following are descriptions of the job descriptor cards used by the SEDS preprocessor and an explanation of the parameter fields of each. The two descriptor cards used are the JOB and SEDS cards.

A. JOB Card. The JOB card appears as the first card of the job card deck. A "J" in column one denotes the card as being a JOB card. This card contains the following initialization information for the SEDS preprocessor:

   - Type of SEDS preprocessor run desired; S = screening run, E = edit run, B = screen edit run.
   - Start Time. Time on 14-track tape at which to begin data transfer



*THESE "TINIT" CARDS ARE OPTIONAL; ALL OTHERS ARE REQUIRED FOR A VALID CARD DECK.

Figure 3-1 SEDS Preprocessor Card Deck

- Stop time. Time on 14-track tape at which to stop data transfer.

- Tape speed. Speed at which the 14-track tape is to be driven for this preprocessor run.

Refer to table 3-1 for the description and position of each field as it should appear on the JOB card.

B. SEDS Card. The SEDS card follows the JOB card and for each run there must be a SEDS card. An "S" in column one denotes the card as being a SEDS card. This card contains the following descriptive information for the preprocessor initialization.

- Data type to be output to the interactive color display on this run; I = infrared, V = visible

- Vehicle pass being processed; D = day pass, N = night pass

- Source vehicle identification; 2 = NOAA2, 3 = NOAA3, 4 = NOAA4

- Source sensor identification; 1 = sensor 1, 2 = sensor 2

- Start pixel is the number of the first sample to be transferred of the entire frame being digitized by the 14-track interface.

- Stop pixel is the number of the last sample to be transferred of the entire frame being digitized by the 14-track interface

- Output tape ID is the ID assigned to the 9-track tape that is used for output in the edit run.

Each of the above constitutes a parameter field on the SEDS card. All the fields, except the "S" in column one, on the SEDS card may be left blank as they will assume a predefined default value. Refer to table 3-2 for the description and position of each field as it should appear on the SEDS card.

TABLE 3-1

JOB CARD

COLUMN	ENTRY	DEFAULT	RANGE	REMARKS
1	J	-	-	ERROR MESSAGE DISPLAYED IF PARAMETER NOT PRESENT
3	S, E OR B	-	-	INDICATES TYPE OF SEDS RUN • S = SCREENING • E = EDIT RUN • B = SCREEN WHILE EDITING PARAMETER MUST BE PRESENT
5-16	START TIME	START OF TAPE	-	FIELD IN THIS FORMAT: XXX:XX:XX:XX
19-30	STOP TIME	END OF TAPE	-	FIELD IN THIS FORMAT: XXX:XX:XX:XX DAY:HR:MN:SC
33-35	TIME SPEED	30	-	THESE SPEEDS BEST FOR SEDS: 030 IPS OR 060 IPS

TABLE 3-2

SEDS CARD

COLUMN	ENTRY	DEFAULT	RANGE	REMARKS
1	S	-	-	ERROR MESSAGE DISPLAYED IF PARAMETER NOT PRESENT
3	I OR V	I	-	DATA TYPE TO DISPLAY ON THIS RUN. • I = INFRARED • V = VISIBLE
7	D OR N	D	-	IDENTIFIES THE DATA AS BEING FROM A DAY OR NIGHT TAPE.
9	VEHICLE	4	2 THRU 4	THE COMBINATION OF VEHICLE AND SENSOR MAKE UP HOW THE HEADER ANNOTATION IS CONSTRUCTED. ALL POSSIBLE COMBINATIONS ARE: • NOAA 2 • NOAA 3-1 • NOAA 3-2 • NOAA 4-1 • NOAA 4-2
11	SENSOR	1	1 OR 2	
13-16	START PIXEL	-	1 THRU 3500	THE START AND STOP PIXEL NUMBERS SPECIFY THE FIRST AND LAST SAMPLE NUMBERS OF THE WINDOW THAT IS TO BE EDITED OR SCREENED FROM THE 14-TRACK TAPE. DEFAULT VALUES VARY AS FOLLOWS: RUN PASS START PIXEL STOP PIXEL E D 500 2778 E N 900 2578 S - 33 3489
18-21	STOP PIXEL	-	1 THRU 3500	
31-42	OUTPUT TAPE I.D.	-	1-12 ASCII ALPHANUMERIC CHARACTERS	TAPE ID THAT IS REQUIRED IN THE UNIVERSAL TAPE HEADER

3.3.1.2 TINIT Cards. Following are descriptions of the TINIT cards used by the SEDS preprocessor and an explanation of the parameter fields of each. The three types of TINIT cards used are the MISSION, ANNOTATION and TAPE UNIT SELECT cards. These TINIT cards may themselves appear in any order, but as a group must appear in the job card deck as shown in figure 3-1.

A. MISSION Card. The MISSION card contains mission specific parameters that are transferred to the output tape header for more accurate data description. This card is a hold-over from the standard preprocessor, so some of the fields may not pertain directly to the SEDS format. The following parameters are available for header initialization.

- Mission number
- Site ID
- Line
- Run
- Orbit
- Month
- Year.

Refer to table 3-3 for the description and position of each field as it should appear on the MISSION card.

B. ANNOTATION Card. The ANNOTATION card contains any general information that the operator desires to be entered into the general annotation area in the 9-track tape header. This information comprises the only field on the card. Refer to table 3-4 for description and position of the field as it should appear on the ANNOTATION card.

C. TAPE UNIT SELECT CARD. The TAPE UNIT SELECT card contains indicators as to the status of the 9-track tape drives and the desired density of the output tape. These indicators are as follows:

TABLE 3-3

MISSION CARD

COLUMN	ENTRY	DEFAULT	RANGE	REMARKS
1	M	-	-	MISSION PARAMETERS WILL NOT BE PRESENT IF 'M' IS MISSING. NO MESSAGE WILL ALERT THE OPERATOR.
3-7	DECIMAL MISSION NUMBER	0	$1\text{-}32767_{10}$	MUST BE LEFT JUSTIFIED.
9-13	DECIMAL SITE NUMBER	0	$1\text{-}32767_{10}$	MUST BE LEFT JUSTIFIED.
15-17	DECIMAL LINE NUMBER	0	$1\text{-}255_{10}$	MUST BE LEFT JUSTIFIED.
19-21	DECIMAL RUN NUMBER	0	$1\text{-}255_{10}$	MUST BE LEFT JUSTIFIED.
23-27	DECIMAL ORBIT NUMBER	0	$1\text{-}32767_{10}$	MUST BE LEFT JUSTIFIED.
29-30	DECIMAL MONTH	0	$1\text{-}12_{10}$	MUST BE LEFT JUSTIFIED.
33-34	DECIMAL DAY	0	$1\text{-}31_{10}$	MUST BE LEFT JUSTIFIED.
37-38	DECIMAL YEAR	0	$1\text{-}99_{10}$	MUST BE LEFT JUSTIFIED.

TABLE 3-4

ANNOTATION CARD

COLUMN	ENTRY	DEFAULT	RANGE	REMARKS
1	G	-	-	NO ANNOTATION WILL BE TRANSFERRED IF G IS MISSING. NO MESSAGE WILL ALERT THE OPERATOR.
11-41	DATA	BLANK	ANY 30_{10} PRINTABLE CHARACTERS	DATA GOES INTO HEADER +2759 THRU +2789

- Status mag tape unit 0; blank = unit operable, 0 = unit inoperable
- Status mag tape unit 1; blank = unit operable, 1 = unit inoperable
- Status mag tape unit 2; blank = unit operable, 2 = unit inoperable
- Status mag tape unit 3; blank = unit operable, 3 = unit inoperable
- Density Select; blank = 800 BPI, 1 = 1600 BPI.

Refer to table 3-5 for the description and position of these indicators as they should appear on the TAPE UNIT SELECT card.

3.3.1.3 Job Card Deck and Initialization Display Correlation. Dynamic parameters read in from the job card deck are displayed in the SEDS initialization display. If any parameter field on a card is left blank, its default value is displayed (see tables 3-1 thru 3-5). Following is a sample initialization display (figure 3-2) and the job card deck used to achieve it (figure 3-3). An explanation of the display and its correlation to the job card deck is given in a numbered parameter by parameter manner. Fields correlating to VT05 SEDS initialization display:

- (1) This identifies to the run if the data to be processed was collected from a day or night pass over the area of interest
- (2) This identifies which vehicle collected the data about to be processed
- (3) This identifies the sensor used to collect the data
- (4) This indicates what type of SEDS preprocessor run is desired
- (5) This field specifies at what time, on the 14-track, data transfer is to begin to memory. If left blank on the card, START OF TAPE will appear in this field in the initialization display

TABLE 3-5

TAPE UNIT SELECT CARD

COLUMN	ENTRY	DEFAULT	RANGE	REMARKS
1	T	-	-	ALL TAPE UNITS ASSUMED OPERATIONAL IF NO TAPE UNIT SELECT CARD OR IF T IS MISSING. NO MESSAGE WILL ALERT THE OPERATOR.
5	0	BLANK	-	IF BLANK, TAPE UNIT NO. 0 WILL BE USED. IF 0, TAPE UNIT NO. 0 WILL NOT BE USED.
9	1	BLANK	-	IF BLANK, TAPE UNIT NO. 1 WILL BE USED. IF 1, TAPE UNIT NO. 1 WILL NOT BE USED.
13	2	BLANK	-	IF BLANK, TAPE UNIT NO. 2 WILL BE USED. IF 2, TAPE UNIT NO. 2 WILL NOT BE USED.
17	3	BLANK	-	IF BLANK, TAPE UNIT NO. 3 WILL BE USED. IF 3, TAPE UNIT NO. 3 WILL NOT BE USED.
21	1	BLANK	-	IF BLANK, OUTPUT TAPES WILL BE WRITTEN AT 800 BPI. IF 1 ALL OUTPUT TAPES WILL BE WRITTEN AT 1600 BPI.

*** SEDS INITIALIZATION ***

PASS D*① VEHICLE NOAA3*② SENSOR 1*③ RUN E*④

TASK START TIME ⑤000:05:15:32* TAPE SPEED 60*⑦
TASK STOP TIME ⑥000:05:27:10*

START PIXEL ⑧0400*
STOP PIXEL ⑨2200*

OUTPUT TAPE ID ⑩SEDS TEST RUN

Figure 3-2 Sample Initialization Job Card Deck

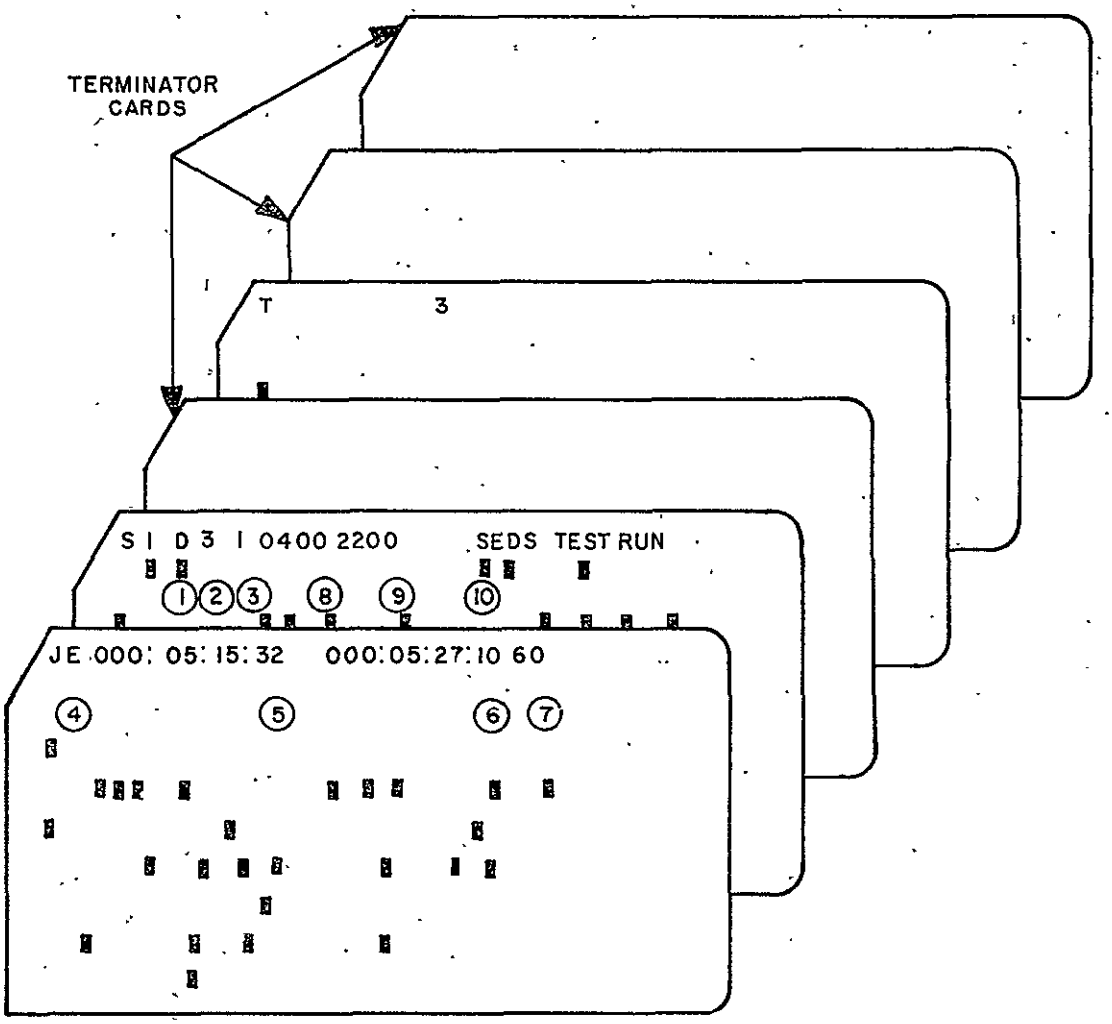


Figure 3-3 Sample Job Card Deck

- (6) This field specifies at what time, on the 14-track, data transfer is to stop and the 14-track halted. If left blank on the card, END OF TAPE will appear in this field in the initialization display

- (7) This parameter specifies at what speed the 14-track hardware is to be driven for processing

- (8) This value is the number of the first sample to be transferred from each data frame processed

- (9) This value is the number of the last sample to be transferred from each data frame processed

- (10) This is the output tape ID and will appear on the display as it was received on the card and indicate how it will be transferred to the tape header.

All fields described above, can be modified through VT05 keyboard inputs after the display has been completely constructed. Remaining fields not marked are used for internal processing and are not used in the initialization display.

3.3.2 VT05 Entries. The operator has the capability of controlling a job or making necessary parameter changes by keying in inputs via the VT05. The inputs available to the operator are cursor controls, operator commands, and parameter updates.

3.3.2.1 Cursor Controls. Those fields in the initialization display (figure 3-2) to which the operator can input via the VT05 are noted with an asterisk (*). These changeable fields can be positioned to by the operator keying in the appropriate cursor control characters as described below:

- ← - moves the cursor from its present position to the preceeding changeable field

- → - moves the cursor from its present position to the succeeding changeable field

- HOME - moves the cursor from its present position to the command field (uppermost left-hand position on the screen)

- EOL - this option is only available when the cursor is presently at the HOME position. It causes the entire uppermost line to be completely erased.

Each of the cursor control characters, when depressed, causes any previously displayed messages in the command field to be erased. After the initialization phase is complete (during the processing phase) there are no changeable fields present on the VT05 display. At this point, any of the cursor control characters will cause the cursor to be positioned to the command field only.

3.3.2.2 Operator Commands. The commands available to the operator allow him to control or determine how the SEDS preprocessor job is to be run. All of the operator commands can only be entered in the command field on the VT05, the HOME position. Explanations of each of the commands and when they can be legally entered are as follows:

A. CORRECT. CORRECT signifies the task parameters currently on the display have been viewed and updated by the operator and are ready for system verification.

B. PROCEED. PROCEED signifies the task parameters currently on the display have been viewed, are correct, and initialization is complete. After this command is issued, the operator can no longer use any other initialization command, i.e., CORRECT, RESTART, CONTINUE.

C. RESTART. RESTART signifies any previous initialization performed is to be discarded and the initialization sequence is to be restarted by rereading the job card deck.

D. CONTINUE. CONTINUE signifies the system is to resume initialization processing that has been temporarily suspended as a result of an error, i.e., invalid card error, fatal read error, etc. Refer to paragraph 3.3.4.3.

All the preceeding commands are legal only during the initialization phase which is terminated by the PROCEED command. The ABORT command is the only legal entry that can be made during the processing phase. ABORT signifies a request to terminate the job immediately.

3.3.2.3 Parameter Updates. The operator has the option to change or update the job initialization parameters by keying them in directly on the VT05. Parameter fields in the initialization display that can be modified are noted with an asterisk (*). Each parameter has a valid range and field length equal to its corresponding card field. To modify a parameter, the operator merely positions the cursor to the field he wishes to change and keys in the update followed by the delimiter (]). After all desired modifications are complete, the operator homes the cursor and enters the CORRECT command. The updated fields are now checked for erroneous inputs and any fields found in error are marked by an "E". Any error found also causes the message UPDATE PARAMETERS IN ERROR to appear on the VT05. Parameters found in error are updated in the same manner as any other modifications to the initialization display. When all updated parameters are correct, the message INITIALIZATION COMPLETE, PROCEED is displayed.

3.3.3 Interactive Color Display (ICD) Entries. The operator has the capability for basic job control and making certain parameter inputs from the ICD during the screening pass of the SEDS preprocessor. All inputs from the ICD are made by issuing an operator interrupt with a defined thumbwheel value from the display control panel.

3.3.3.1 Display Console Operation. The only complete operational description given is that which is required to enter a command from the display console. The majority of the display console options only control the format of how the data is transferred from the display memory to the screen. The basic console actions required for the SEDS screening run are divided into the following three groups (refer to figure 3-4 for console layout):

A. Console Initiation. The following points encompass all the display console actions required to achieve a recognizable display image. This is assuming that the display hardware is powered up and properly configured.

- All the color guns are enabled under COLOR SELECT
- The MODE dial is set to the OFF position.

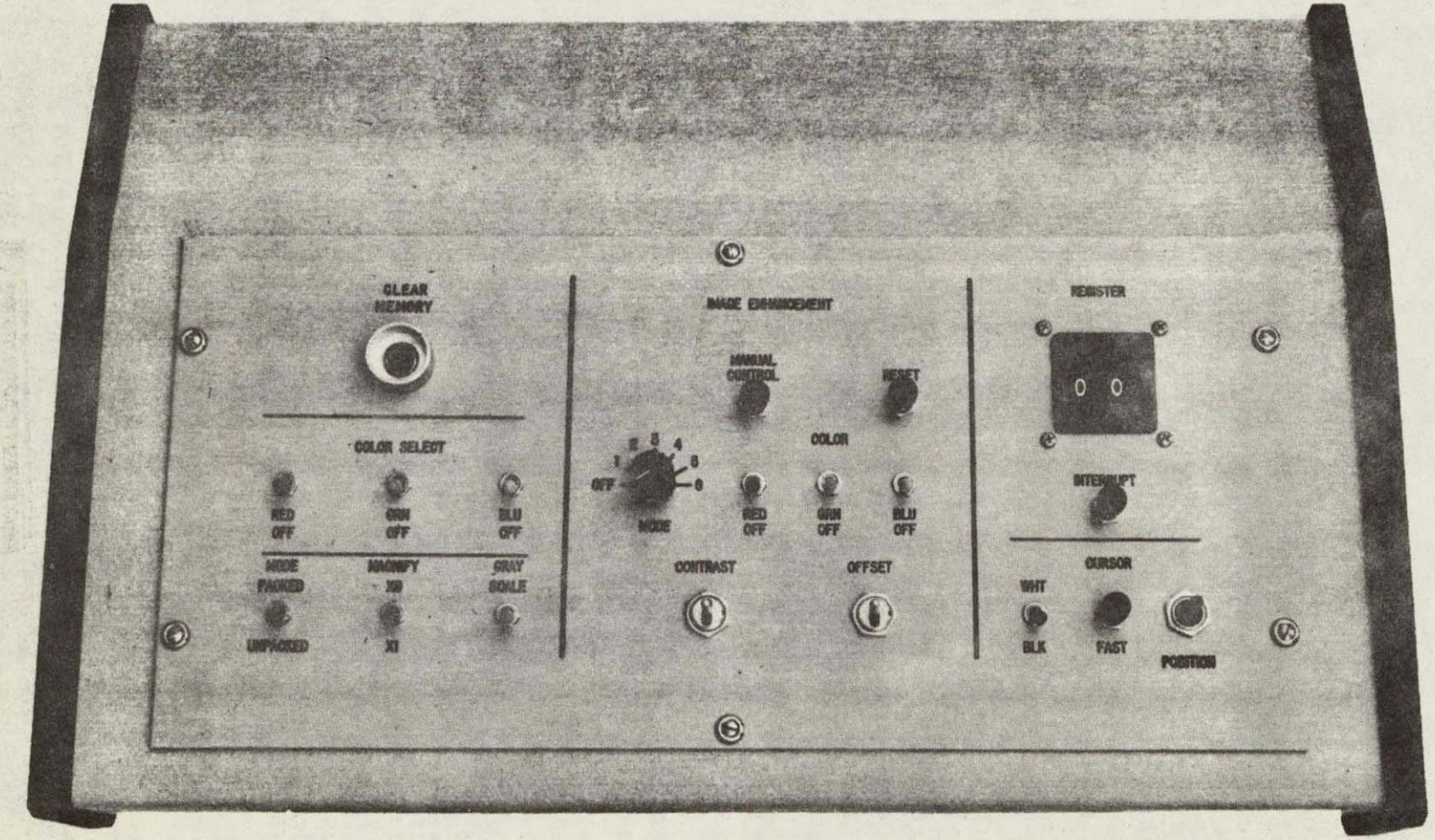


Figure 3-4 Interactive 525-Line Color Display Control Console

After the processing phase of the run is entered and the image begins scrolling onto the screen, the operator is free to utilize any of the console options desired. The only console controls that should not be functioned during the run are the CLEAR MEMORY and RESET buttons.

B. Cursor Control. The cursor status is controlled by the three console switches under the label CURSOR.

- Cursor Color. Depending on the predominate color of the displayed image, the operator can select the cursor to be displayed in either white or black for better definition.

- Cursor Speed. The speed at which the cursor moves can be increased by depressing the FAST button while the cursor is being positioned.

- Cursor Position. The cursor is initialized internally to the lower left-hand corner at the beginning of the screening run.

When the processing phase of the run is entered, the operator can reposition the cursor to any point on the screen by using the POSITION switch. This is an eight-position switch that is functioned in a 'joystick' manner to move the cursor to the desired point.

C. Command Entry. Commands are entered through the display console by dialing up a defined command value in the thumbwheel register and depressing the INTERRUPT button.

When the processing phase of a screening run is entered and any type of console function is desired, the MANUAL CONTROL button needs to be functioned once. This is a one time operation that transfers control of display console from the software to the console itself.

3.3.3.2 Display Operator Commands. Each display command is associated with a two digit number that is entered in the console register, refer to Command Entry, paragraph 3.3.3.1.C. The following are the only defined command values. Entry of any other value will result in an error message being displayed in the message field of the VT05 (ILLEGAL INTERRUPT VALUE).

- 00 = Halt 14-track. The 14-track tape is halted. The system continues to idle processing any other display inputs until a terminate command (99) or an ABORT VT05 command is received

- 10 = Define Top. The cursor position is inputted as defining the upper boundary of an area of interest being outlined

- 11 = Define Bottom. The cursor position is inputted as defining the lower boundary of an area of interest being outlined

- 20 = Define Right. The cursor position is inputted as defining the right boundary of an area of interest being outlined

- 21 = Define Left. The cursor position is inputted as defining the left boundary of an area of interest being outlined

- 30 = Tab. The cursor position is inputted as defining the line and pixel location of a particular point within the area of interest already outlined

- 99 = Terminate. Terminates the screening run.

A particular hierarcy must be followed in issuing commands from the display console. The first valid commands recognized are Halt 14-track (00) and Terminate (99). After the tape is halted, the boundaries may be defined in any order, but at least two adjacent sides for an area of interest must be defined before a Tab (30) can be located. After a Tab is issued, boundary definition is closed. An attempt to issue a command out of sequence will result in an error message being output to the message field of the VT05 (INT ISSUED OUT OF SEQUENCE). The boundaries and tabs located are converted to pixel numbers and recorded tape times or line numbers. These values are output on a display summary report upon termination of the screening run.

3.3.4 VT05 Displays. This paragraph covers the description of the two VT05 displays that are generated by the SEDS preprocessor. All references to a display in this paragraph are directed to the VT05, not to the ICD.

A. Initialization Display. The first display generated on the VT05 by the SEDS preprocessor is the Initialization Display (see figure 3-2). Each parameter on the display reflects either a default value or a value specified in the Job Card Deck. Each field on the screen followed by an asterisk may be updated via the VT05 keyboard. All parameter fields in the Initialization Display, their acceptable values, and methods used for updating them are covered in great detail in paragraph 3.3.2.

B. Real-Time Data Quality Display. The Real-Time Data Quality Display appears on the VT05 during the processing phase and requires no operator action to initiate or interact with it (see figure 3-5). The Real-Time Data Quality Display is exactly what its name implies. It presents a brief periodic report on the quality of the data being processed in the current SEDS run for the operator to monitor. The report is generated approximately every fifteen seconds until a run termination is received. The TASK START/STOP TIMES, TAPE SPEED, OUTPUT TAPE, PASS, COMPRESSION, and START/STOP PIXEL values are initialized on the display at the beginning of the processing phase and remain static throughout the run. These values, with the exception of START/STOP PIXEL and COMPRESSION, will be equal to those output in the Initialization Display. The exceptions take place only during the screening run when the sample window size is expanded to the next even multiple of 576 to achieve an even compression factor. The CURRENT TAPE TIME changes with each update of the screen. This update reflects the current time read from the 14-track NOAA tape, converted and inputted to the system from the time code translator. The PARITY ERRORS field indicates the number of parity and/or CRC errors occuring on the 9-track output tape. This total is reinitialized to zero as

TASK START TIME	000:05:15:32	TAPE SPEED	GO
CURRENT TAPE TIME	000:05:18:26	OUTPUT TAPE	SEDS TEST RUN
TASK STOP TIME	000:05:27:10	PARITY ERRORS	0000

PASS D COMPRESSION - 4
START PIXEL - 0400
STOP PIXEL - 2200

DATA SETS PROCESSED	VISIBLE BAD TAGS	INFRARED BAD TAGS	ILLEGAL TIME DELTAS
762	12	14	7

Figure 3-5 Sample Read-Time Data Quality Display

a reel of tape is filled and output overflows to the next available magnetic tape unit. The remaining fields are counters which reflect exactly what each of their titles implies. DATA SETS PROCESSED gives the decimal number of complete data sets screened or logged to 9-track tape. VISABLE/INFRARED BAD TAGS give the count of illegal data tags detected. To achieve the count of ILLEGAL TIME DELTAS, the difference of the recorded tape times of subsequent data frames is determined and the count incremented if the difference exceeds 150 ±5 ms.

C. Advisory and Error Messages. Advisory and error messages are output to the VT05 display message field or the DECwriter to inform the operator of various system conditions. Tables 3-6 and 3-7 list these messages, their descriptions, and suggested operator responses. Special attention should be paid to messages indicating fatal conditions. In these cases, strictly adhere to the steps outlined in paragraph 3.5.3. The situation may appear where the 14-track interface never comes into lock, drops out of lock, or has stopped transferring data periodically or completely. In any of these cases or if the central processing unit (CPU) just stops processing, the hardware interface setup should be rechecked for proper configuration. If the interface is correctly structured and the system will not cycle, follow the instructions outlined in paragraph 3.5.3.

TABLE 3-6

VT05 MESSAGES

VT05 MESSAGE	DESCRIPTION AND OPERATOR ACTION
1. INVALID JOB CARD	CORRECT CARD, REPLACE IN READ HOPPER, READY CARD READER AND ENTER VT05 'CONTINUE' COMMAND.
2. INVALID SEDS CARD	SAME AS ABOVE
3. FATAL READ ERROR, RESTART	D05 ERROR IN DISK READ - RELOAD ENTIRE JOB CARD DECK INTO READER, READY CARD READER AND ENTER VT05 'RESTART' COMMAND.
4. UPDATE PARAMETERS STILL IN ERROR, CORRECT	CORRECT ERRONEOUS PARAMETERS IN DISPLAY AND TYPE VT05 'CORRECT' COMMAND
5. INITIALIZATION COMPLETE PROCEED	ENTER VT05 'PROCEED' COMMAND
6. INITIALIZATION COMPLETE, DEGRADED MODE	NO ACTION REQUIRED
7. INVALID COMMAND	ERRONEOUS INPUT TO COMMAND FIELD OR COMMAND INVALID DURING CURRENT PHASE. KEY IN NEW INPUT.
8. CURSOR NOT POSITIONED	CURSOR NOT PRESENTLY POSITIONED TO A VT05 FIELD. HOME CURSOR AND POSITION TO DESIRED FIELD.
9. PARAMETER EXCEEDS FIELD LENGTH	TOO MANY CHARACTERS FOR FIELD BEING MODIFIED. REPOSITION CURSOR AND ENTER CORRECT INPUT.
10. SOFTWARE ABORT	OPERATOR ADVISORY OF ABORTION OF JOB DUE TO SYSTEM FAILURE. NO OPERATOR ACTION REQUIRED.
11. DAY WINDOW EXCEEDS 2500 SAMPLES	SEDS DAY WINDOW MAY NOT EXCEED 2500 SAMPLES. ANY WINDOW SIZE LESS THAN 2500 MAY BE USED. ADJUST START/STOP PIXEL VALUES.
12. NIGHT WINDOW MUST = 1800 SAMPLES	SEDS NIGHT WINDOW REQUIRES A SAMPLE COUNT OF 1800 PIXELS. ADJUST START/STOP PIXEL VALUES.
13. ILLEGAL INTERRUPT VALUE	UNDEFINED COMMAND VALUE ENTERED IN INTERACTIVE DISPLAY CONSOLE REGISTER. CORRECT REGISTER VALUE AND REISSUE COMMAND.
14. INT. ISSUED OUT OF SEQUENCE	INTERACTIVE COLOR DISPLAY COMMAND HIERARCHY VIOLATION. CORRECT REGISTER VALUE AND REISSUE COMMAND.
15. INSUFFICIENT DATA FOR TABS	TWO ADJACENT BOUNDARIES HAVE NOT BEEN DEFINED. DEFINE BOUNDARIES, THEN LOCATE TABS.
16. ILLEGAL BOUNDARY DEFINITION	INVALID CURSOR POSITION FOR BOUNDARY COMMAND, I.E., DEFINING RIGHT EDGE TO THE LEFT OF AN ALREADY DEFINED LEFT EDGE. REDEFINE NECESSARY BOUNDARIES
17. EDIT RUN NEEDS OUTPUT TAPE ID	NO OUTPUT TAPE ID WAS ENTERED WHEN RUN WAS CHANGED FROM 'S' TO 'E', ENTER ID.

TABLE 3-7

DECWRITER MESSAGES

DECWRITER MESSAGES		DESCRIPTION AND OPERATOR ACTION
A0002	0	MT0 NOT READY (FIRST REEL ONLY). READY UNIT.
A0002	1	MT1 NOT READY (FIRST REEL ONLY). READY UNIT.
A0002	2	MT2 NOT READY (FIRST REEL ONLY). READY UNIT.
F 372	1	SECOND OR SUBSEQUENT REEL OF A MULTIREEL JOB NOT READY. RESTART JOB WITH ALL UNITS READY.
F 372	2	FATAL INTERNAL SOFTWARE PROBLEM. TAKE DUMP FOR ERROR REPORT AND ATTEMPT RERUN.
F 372	3	FATAL INTERNAL SOFTWARE PROBLEM. TAKE DUMP FOR ERROR REPORT AND ATTEMPT RERUN.
F 372	4	NOT ENOUGH TAPE UNITS FOR MULTIREEL RUN, A 'T' CARD MAY BE REQUIRED. RESTART JOB.
F 372	5	MAGNETIC TAPE CONTROLLER ERROR. TAKE DUMP PLUS RECORD CONTENTS OF REGISTERS 172520-172534/ 172720-172734 AND ATTEMPT RERUN.
F 372	6	EXCESSIVE PARITY ERRORS, RERUN WITH NEW MAGNETIC TAPE OR DIFFERENT TAPE DRIVE.
F 373	XXXXXX	FATAL ERROR GENERATED FROM IMPROPER 14-TRACK INTERFACE SETUP. TAKE DUMP AND RECORD ADDRESS OF ERROR (XXXXXX), THEN ATTEMPT RERUN.
F 377	PC	FATAL INTERNAL SOFTWARE PROBLEM. TAKE DUMP FOR ERROR REPORT AND ATTEMPT RERUN.

3.4 SUMMARY REPORTS

Following the normal end-of-job or after a job has been aborted, data quality and run description information logged during the processing phase is output in the form of printed summary reports. The four reports generated are the Data Quality Report, Parity Error Log, Operator Command Report, and the Interactive Display Command Report. Descriptions of each of the summary reports follows.

3.4.1 Data Quality Report. This report is made up of three parts or sub-reports; the job initialization parameters, one-minute data quality checks, and a job summary.

A. Initialization Parameters. This portion appears first in the Data Quality Report. It contains the final initialization parameters, updates, or defaults used to process the current run. The printout appears similar to the task initialization display with each field recorded as it appeared on the VT05 when the PROCEED command was processed. Figure 3-6 is an example of how the initialization parameters portion of the Data Quality Report would appear for a run using the parameters given in figure 3-7.

B. One-Minute Data Quality Checks. This portion of the report appears after the initialization parameters. It contains counters of the number of scan lines processed, illegal data tags detected, and invalid time deltas detected between buffer-full interrupts. These counters are not the accumulative total values, but are delta values for the time span between each one-minute quality check. The time period for the check and the output tape ID is also included in the report. Figure 3-7 is an example of the format for the one-minute data quality report.

C. Job Summary. This portion of the quality report appears as the final segment. The format is similar to the One-Minute Data Quality Checks and it contains the same error processing counters. The only difference is that the figures in the summary are accumulative values for the entire job rather than over one minute intervals. Figure 3-8 is an example of the format for the job summary report.

```
PASS D
VEHICLE NOAA3
SENSOR  1
RUN  E


START PIXEL   400
STOP PIXEL   2200


START TIME   000:05:15:32
STOP TIME    000:05:27:10
TAPE SPEED   60


OUTPUT TAPE 10  SEDS TEST RUN
```

Figure 3-6 SEDS Preprocessor Initialization Parameters

START TIME: 000:05:15:32
STOP TIME: 000:05:16:01
DELTA TIME: 000:00:00:29
OUTPUT TAPE ID - SEDS TEST RUN

DATA SETS PROCESSED	VISIBLE BAD TAGS	INFRARED BAD TAGS	ILLEGAL TIME DELTAS
420	12	13	3

START TIME: 000:05:16:01
STOP TIME: 000:05:16:31
DELTA TIME: 000:00:00:30
OUTPUT TAPE ID - SEDS TEST RUN

DATA SETS PROCESSED	VISIBLE BAD TAGS	INFRARED BAD TAGS	ILLEGAL TIME DELTAS
423	0	2	0

Figure 3-7 One-Minute Data Quality Report

START TIME: 000:05:15:32
STOP TIME: 000:05:27:10
OUTPUT TAPE ID - SEDS TEST RUN

DATA SETS PROCESSED	VISIBLE BAD TAGS	INFRARED BAD TAGS	ILLEGAL TIME DELTAS
4792	24	27	5

Figure 3-8 SEDS Preprocessor Job Summary

3.4.2 Parity Error Report. This report correlates the occurrence of parity/CRC errors on the 9-track tape to particular scan lines of the transmitted data. Included are the reel number, magnetic tape unit, total parity error count, and a list of associated scan line numbers. Figure 3-9 is an example layout of a parity error report.

3.4.3 Operator Command Report. This report is a sequential listing of all operator commands executed during a preprocessor run. The command code is listed and tagged with the system time and if available the tape time of when the entry was made. The commands that would appear on the report are; CORRECT, PROCEED, RESTART, CONTINUE, ABORT. Figure 3-10 is an example layout of the operator command report.

3.4.4 Interactive Display Entry Report. This report is output last and will only appear at the termination of a screening run. The delimiting values for the area of interest that was outlined during the screening run are output so they may be used as initialization parameters for the edit run. A list of points may be printed defined by scan line and pixel numbers of where they lay in respect to the area of interest defined. These may assist the operator in locating ground control points in subsequent processing phases. A maximum of 16 points may be located. Figure 3-11 is an example of the layout of the interactive display entry report. This report is also output in basically the same format to the VT05 before job termination. This is to assist a remote operator in picking up the delimiters for correct initialization of the edit run to follow. Figure 3-12 is an example of this VT05 display output.

```
REEL NO 01    MAG TAPE UNIT  00  TOTAL PARITY ERRORS  5

                15     27          87
              786    788

REEL NO 02    MAG TAPE UNIT  01  TOTAL PARITY ERRORS  4

              8642   8643        8644
              8646
```

Figure 3-9 Parity Error Report

CMD CODE	NOAA TAPE TIME	SYSTEM TIME
CORRECT		00:03:20
PROCEED		00:03:23
ABORT	000:05:25:34	00:03:31

Figure 3-10 Operator Command Report

START TIME 000:05:17:12
STOP TIME 000:05:23:32

START PIXEL # 450
STOP PIXEL #2740

POINTS LOCATED BY OPERATOR

PNT	SCAN #	PIXEL #
1	326	642
2	515	1025
3	1001	734

Figure 3-11 SEDS Outline for Area of Interest to be Edited

SCREWWORM ERADICATION DATA SYSTEM
OUTLINE FOR AREA OF INTEREST TO BE EDITED

START TIME 000:05:17:12 START PIXEL # 450
STOP TIME 000:05:23:32 STOP PIXEL # 2740

POINTS LOCATED BY OPERATOR

PNT	SCAN #	PIXEL #	PNT	SCAN #	PIXEL #
1	326	642	9	1322	271
2	515	1025	10	1457	860
3	1001	734	11	136	1439
4	576	1047			
5	845	967			
6	794	454			
7	658	763			
8	1243	521			

Figure 3-12 Sample Screening Run Termination Video Display

3.5 OPERATOR ACTIONS

It is assumed that the operator is familiar with the basic operating procedures and that the 14-track and interactive display interfaces are properly configured for a SEDS preprocessor run. The required operator actions to start and run the SEDS preprocessor are divided into the three basic categories, each dealing with a unique phase of the run.

3.5.1 System Initialization. The steps for initialization of the DOS in preparation for making a preprocessor run follow.

A. Locate and load the most current SEDS preprocessor disk on DK0 and load a scratch disk on DK1.

B. If making an edit run, ready the magnetic tape units to be used.

C. Boot the system into the PDP 11/45.

D. Enter current time and data via the DECwriter.

```
$DA  DD-MMM-YY
$TI  HH:MM:SS
```

E. Log on the system under UIC 30,1.

```
$LO  30,1
```

F. Zero the scratch disk by entering:

```
$RU  PIP
#DK1:/ZE
```

At this point the DECwriter will return to the operator the message CONFIRM. To this the operator responds by entering the character "H".

G. While still under PIP after DK1 has been zeroed, enable the UIC's necessary by the SEDS preprocessor.

```
#DK1:  [30,1], [30,30], [40,40], [60,60], /EN
```

H. Exit PIP by typing the following:

CTRL/C
.KI

The system is now ready to run the preprocessor.

3.5.2 Preprocessor Initialization. To initialize the SEDS preprocessor software, place the SEDS preprocessor job deck in the reader and ready it. Enter the following commands to bring the preprocessor into execution.

$RU SYSD
$RU MVCORD
$RU AMAGE

Following the $RU AMAGE command, the descriptor cards will be read and the initialization display will appear on the VT05. The operator can now make modifications to the initialization parameters on the VT05 and when satisfied begin processing. This can be accomplished in either of the following ways:

A. If all the parameters are correct and no changes are to be made on the VT05, the operator only needs to enter the PROCEED command.

B. If changes are required, after making them, the operator needs to enter the CORRECT command to validate the entries. If all is well, the message INITIALIZATION COMPLETE, PROCEED is displayed and the operator can now enter that command.

3.5.3 Error Documentation. If any error condition occurs for which a discrepancy report (DR) is to be generated, the following should also be supplied.

A. If the condition occurs during a screening run, the display registers need to be recorded. They are locations 765500 through 765516.

B. A core dump needs to be taken at the point when the error occurs. The following steps will achieve the desired dump:

- Depress HALT switch
- Set switch register to 150000_8
- Depress LOAD ADDR switch
- Raise HALT switch
- Depress START switch.

The printer should immediately respond by outputting a core dump. If the dump does not begin, follow the next sequence and note on the dump that this method was required.

- Boot system
- Log in under 30,1
- Type the following:

```
$GE AMAGE
$BE 150000
```

C. The job card deck should be duplicated and submitted with the DR.

D. If the run for which the DR is being written, was terminated in a normal manner, the summary reports should be submitted with the DR.

When and where within a SEDS production run the error occurs or is detected governs which of the above items is pertinent. It should be remembered that the amount and accuracy of the data collected on an error is relevant on how quickly the problem can be resolved.

SECTION 4

ENGINEERING UNIT CONVERSION PROGRAM (SEU)

4.1 PROGRAM DESCRIPTION

The Engineering Unit (EU) processing module takes the raw pulse code modulation (PCM) preprocessed 9-track tape as input and converts the infrared (IR) channel voltage values to corresponding temperature values. This includes radiometric correction (atmospheric) and EU conversion of the data. The visible (VIS) channel is transferred directly as is to the output tape. The resultant output product of SEU processing is a 2-channel (IR/VIS) universal 9-track tape to be used as input for registration processing. There is a standard output of 2200 scans for day and 2500 scans for night. If necessary, zero fill channels are inserted to assure the maximum scan output on the EU tape.

4.2 OPERATING PROCEDURES

The SEDS is to be initialized as outlined in section 2, SEDS System Initialization Procedures. On the SEDS initial display (figure 2-1) the operator will key in the call letters SEU on the command line to bring in the SEU processing phase. The following steps will be taken:

- A message will be output to the VT05 to mount the input tape on MT0
- Mount the raw 9-track input tape (SPD/SPN) on magnetic tape unit 0; put 'on line'
- Mount a certified 9-track tape for output on magnetic tape unit 1; put 'on line'
- Hit HOME key to position to command line; key in GO to read header on input tape
- The SEU initialization display is now output to the VT05 (refer to figure 4-1)

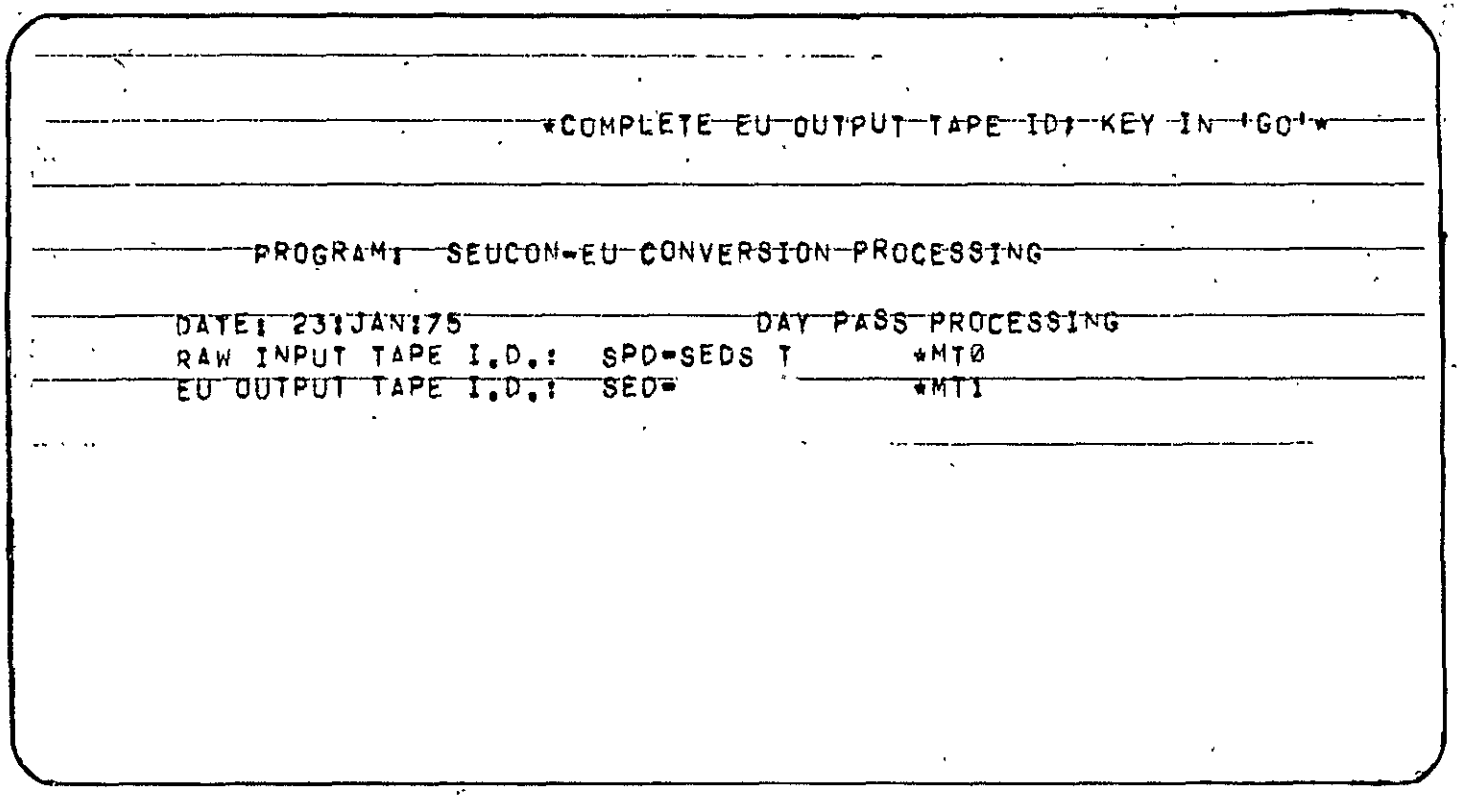


Figure 4-1 SEDS Initialization Display

- Hit ALT key to position to the output tape ID field on the display. The operator now assigns an output tape ID number using any alpha or numeric characters up to a maximum of 6. This information is put on the header of the output tape
- Hit HOME to position to the command line; key in GO to initiate processing
- When SEU processing is completed, a message is displayed on the VT05.

SECTION 5

REGISTRATION PROGRAM (SRE)

5.1 PROGRAM DESCRIPTION

The registration processing phase is for the purpose of taking an EU processed tape and registering (mapping the data tape image) to a predefined SEDS reference grid. This process consists of the following:

A. Locate preassigned ground control points from the tape image to provide a means of obtaining coefficients for mapping the image to the reference grid.

B. If the EU input tape is a night image, the image is rotated and inverted to conform to a day image.

C. Use the mapping coefficients to determine the amount of scaling, translation, and rotation to apply to the data to achieve correct registration.

D. After completing the scaling, translation, and rotation of the data, build a registered disk file with the night IR, day IR, and VIS channel registered data.

The registration phase also provides optional output products of a registered IR tape and isothermal products.

5.2 SRE INITIALIZATION PROCEDURES

The following steps will be taken to initialize the SRE.

A. On the SEDS initial display (figure 2-1), key in the program call letters SRE to bring up the SRE processing phase.

B. The SRE initialization display is now output to the VT05 screen. Refer to figure 5-1.

C. Hit ALT key to position to the PROCESSING OPTION field on the display.

D. The operator selects the type of processing mode required for the run by keying in the number code of the desired option. There are four mode options available.

- Day registration - option 1
- Day restart registration - option 2
- Night registration - option 3.
- Night restart registration - option 4.

E. A message will be displayed on the VT05 informing the operator on which magnetic tape unit to mount the input tape.

F. After input tape has been mounted and put on line, hit HOME key to position to the command line; key in GO.

G. The VT05 screen is cleared.

H. The header on the EU input tape is read in. An error message is displayed if the tape ID does not correspond to the type of processing selected. (Refer to paragraph 9.1, Advisory/Error Messages).

I. When program detects correct tape is being input, control is given to the particular processing mode selected and its display is output to the VT05. (Refer to paragraphs 5.3 through 5.6 for a description of each mode and its operating procedures).

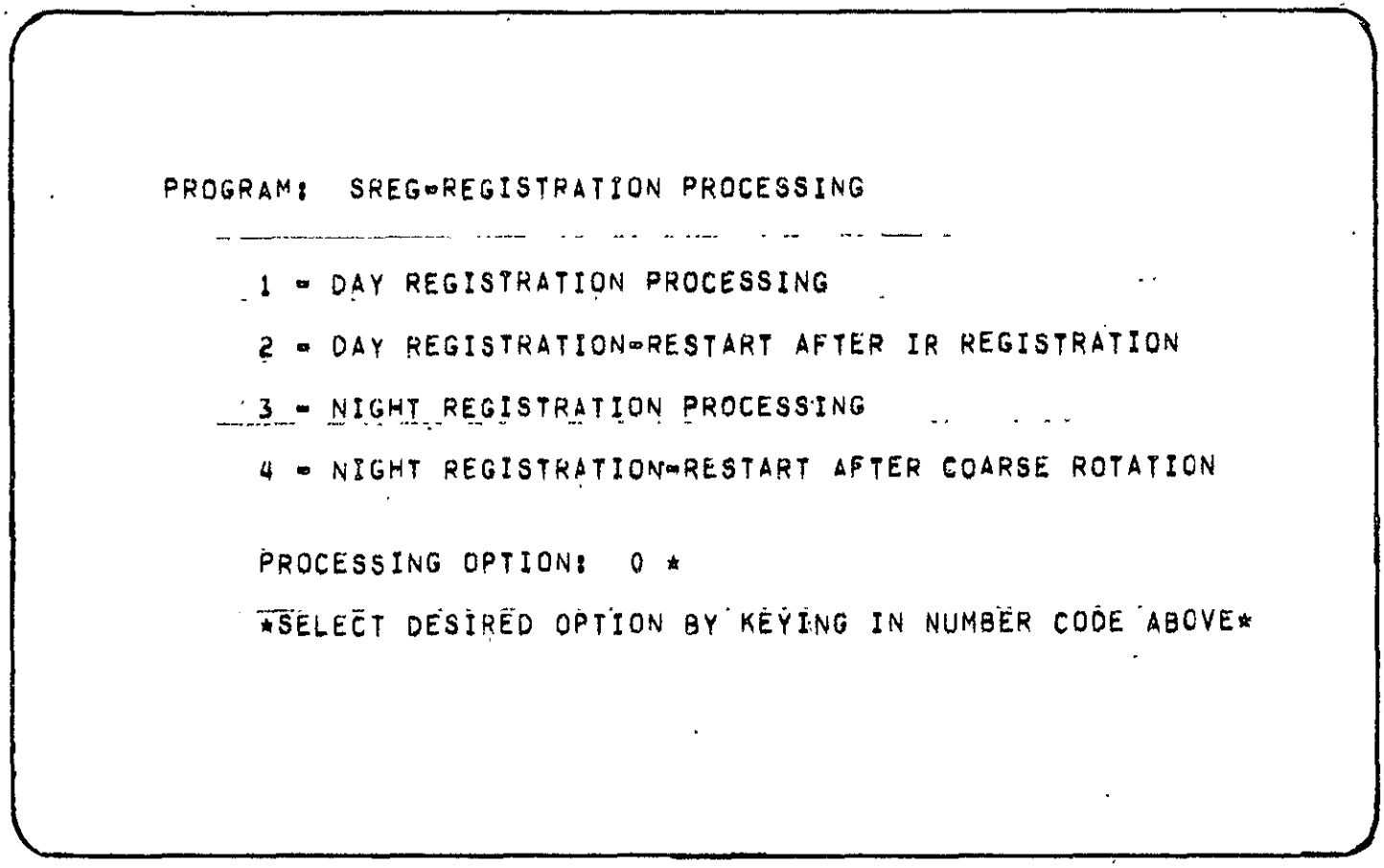


Figure 5-1 SRE Initialization Display

J. Should the operator key in the wrong option code, this can be rectified as follows:

- If prior to keying in GO command, merely position back to the PROCESSING OPTIONS field and make new input.
- If at any time after keying in GO command (i.e. header is read in, processing display output) position cursor to command line and key in RST. This will bring back the SRE initial display (figure 5-1).

5.3 DAY REGISTRATION OPTION

This option provides full registration of an EU day tape with formatted IR/VIS data output to the registered disk file on DK1. There are selectable options of ground control point (GCP) screening, registered IR output tape, and isothermal output products. Either GCP screening, coefficients stored on disk, or coefficient card input option is required for obtaining the mapping coefficient to be used in registering the day input image to the reference grid. The actual processing consists of two passes; the first pass for the day IR channel, the second for the day VIS channel. During the day IR channel pass, the registered IR tape and/or isothermal products are built if these options are selected.

5.3.1 Configuration. The configuration setup for normal day registration is outlined in figure 5-2. The amount of configuration required is determined by the options selected from the day registration processing display.

5.3.2 Operation Procedures. The day registration option is initialized as follows.

A. The day registration processing display is output to the VT05 screen (refer to figure 5-3). The display reflects the input tape ID so verification that the correct tape is mounted can be made.

B. By hitting the ALT key, the operator can position to the input fields denoted by an asterisk on the VT05 display.

C. Position to the tape ID fields on the display for each output tape.

D. The output tape ID mnemonics (SMD,0ID) come up initially with the display background. The operator is to fill in a unique tape ID number for the registered IR and/or isothermal tape if these optional output products are requested. Enter a maximum of six (alpha or numeric) characters in this field to be placed as the tape ID number in the output tape header record.

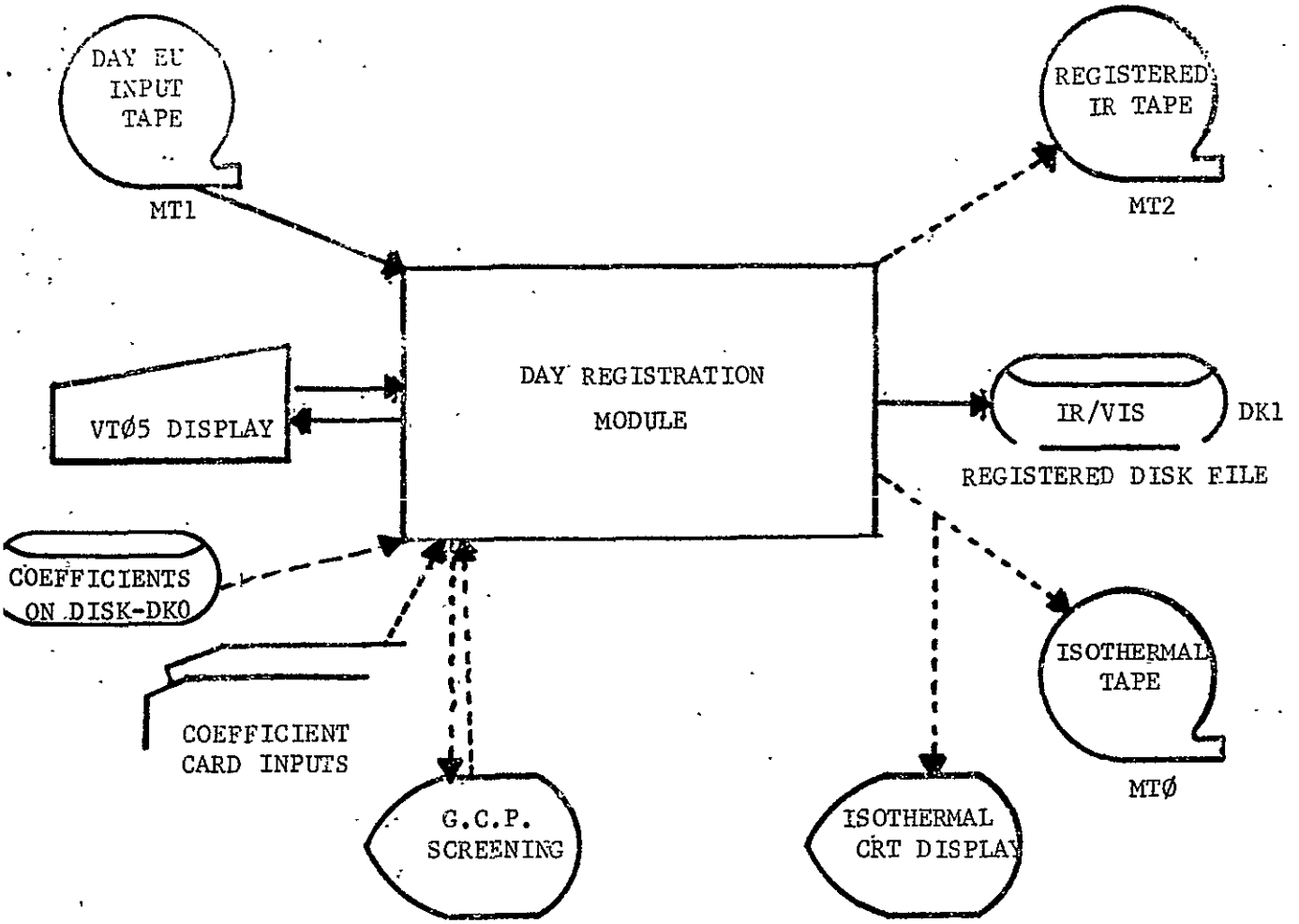


Figure 5-2 Configuration Setup

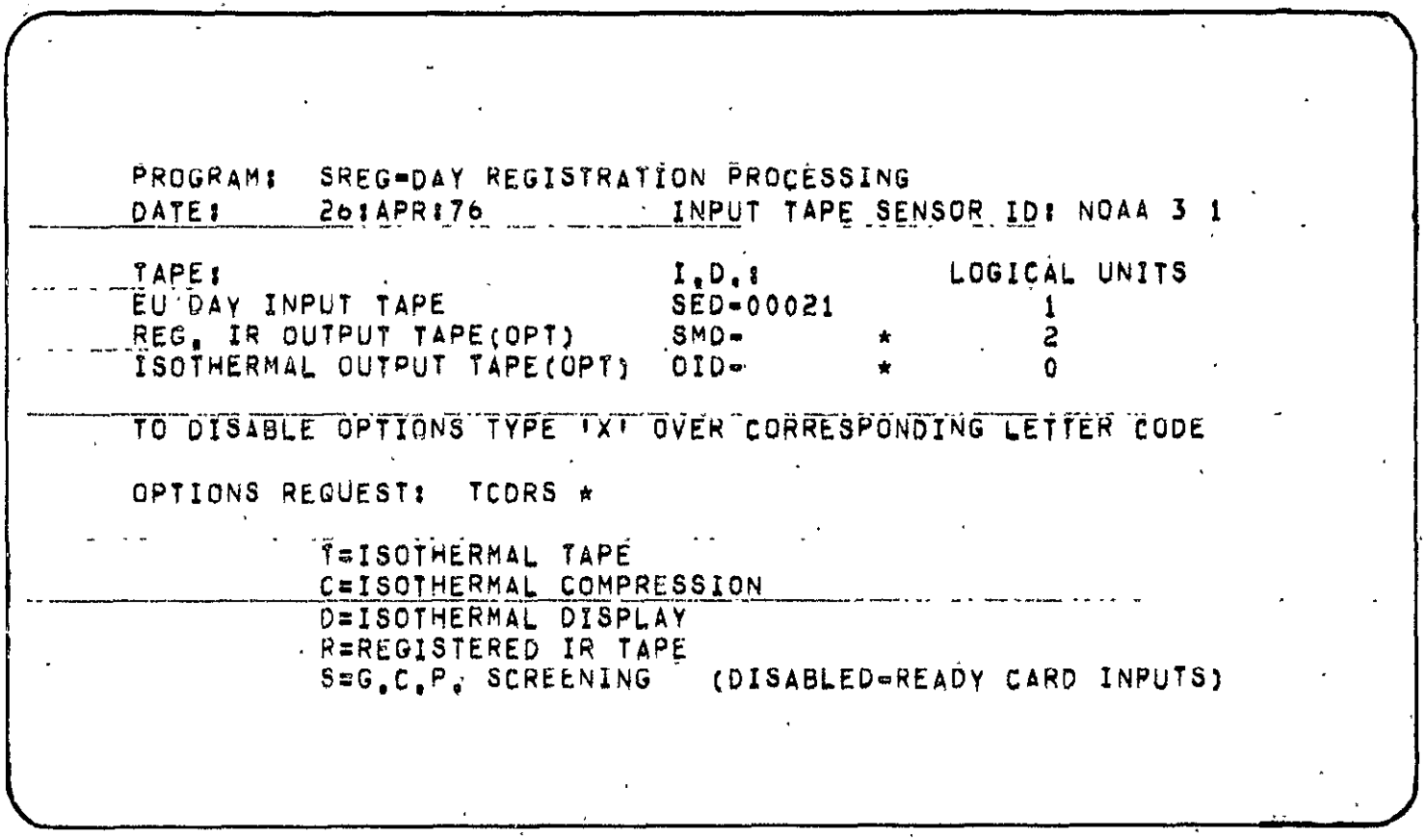


Figure 5-3 Day Registration Processing Display

E. Position to the OPTIONS REQUEST field. This field initially comes up with the letter codes TCDRS *. The code descriptions are immediately following on the VT05 display. Key in a 'X' over the letter code for those options not requested. Example:

OPTIONS REQUEST: TXXRS

This indicates that the operator is requesting isothermal output tape (normal 1 to 1 compression), registered IR output tape and GCP screening. The options for isothermal display and 4 to 1 compression for isothermal products are disabled.

F. Hit HOME key to position to the command line; key in GO. At this point, if GCP screening was requested the GCP display is now output to the VT05. (Refer to paragraph 5.7, GCP Screening Procedures). If GCP screening was not selected, the operator has the option of using the coefficients saved on disk (DK0) or card inputs of the coefficients to be used by the registration processing module. Refer to paragraph 5.8, Registration (Card Inputs of Disk-Saved Coefficients), for the operating procedures at this point.

The commands available during this phase (prior to the GO command) are:

- RST. Returns back to the registration initial display (figure 5-1). To be used if the wrong processing option was selected or incorrect EU input tape.

- ABT. Terminates any processing; returns back to SEDS initial display (figure 2-1).

5.4 DAY RESTART REGISTRATION OPTION

This option provides the capability of beginning registration of the VIS channel after the IR channel data has been registered. There could be occasions of a problem occurring with the tape drives, a system failure, or production time restraints when processing is halted after the IR channel registration pass has been completed. This restart option takes the EU input tape, the DK1 disk with the registered IR data file, coefficient card inputs or coefficients saved on disk and begins with the VIS registration pass. There are no selectable options in this processing mode as the GCP screening should have previously been completed and the output products built during a normal day registration run. This processing mode is available and should be used only as a recovery tool.

5.4.1 Configuration Setup. The configuration setup for day restart registration is outlined in figure 5-4.

5.4.2 Display/Operation Procedures. The following steps initialize the Day Restart Registration option.

A. The day restart registration processing display is output to the VT05 screen (refer to figure 5-5). The display reflects the tape ID of the input tape so the operator can verify the correct EU day tape is mounted.

B. The operator can input the required mapping coefficients into the system via card inputs or retrieval of the disk-saved coefficient on DK0. If the operator wants to use the coefficients saved on disk, refer to paragraph 5.8. If card inputs are used, the operator places the cards in the reader with the RESET button depressed and enters GO. The same coefficients used for the IR channel registration must be used for this pass.

C. The card inputs are read in and a tabout of the inputs is output to the line printer. The coefficients on the cards are saved on disk in case of a rerun.

D. A message, notifying the operator to mount the registered disk on DK1, is output to the VT05.

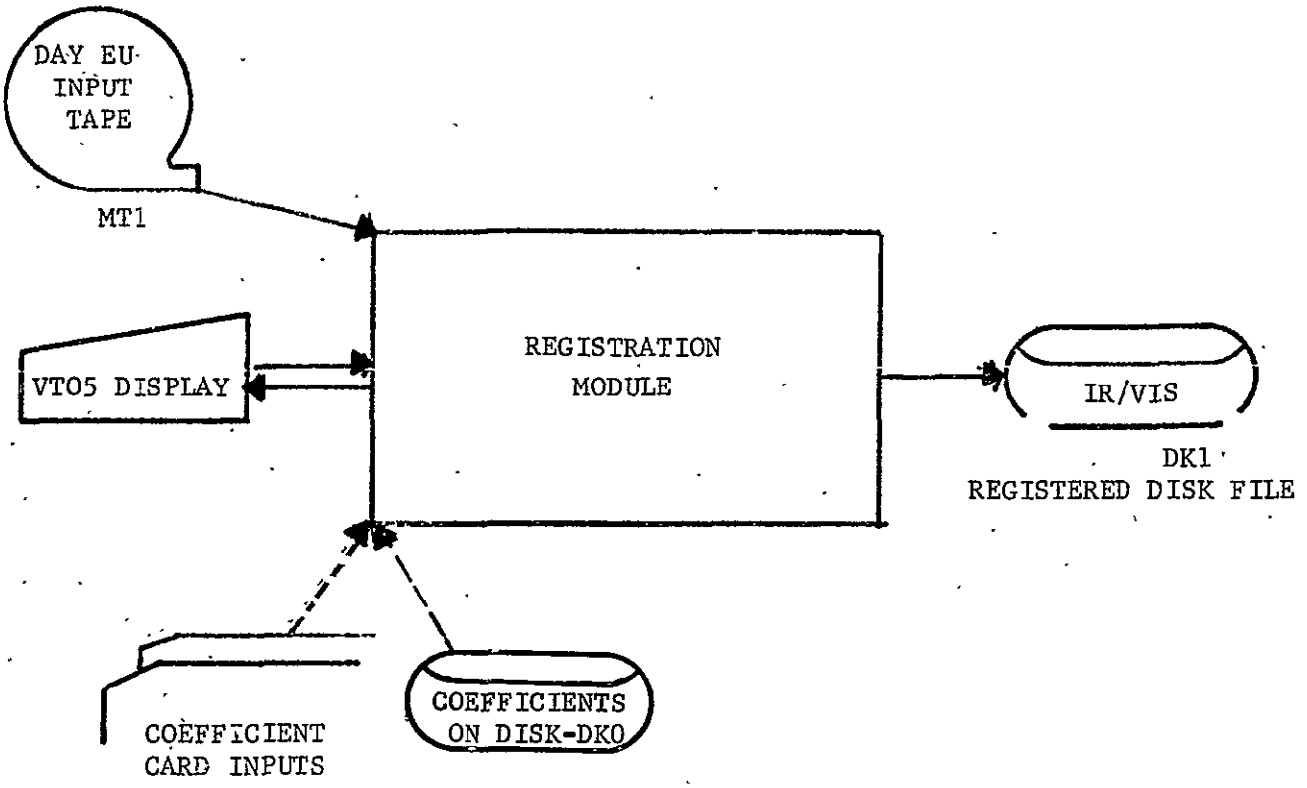


Figure 5-4 Day Restart Registration Configuration Setup

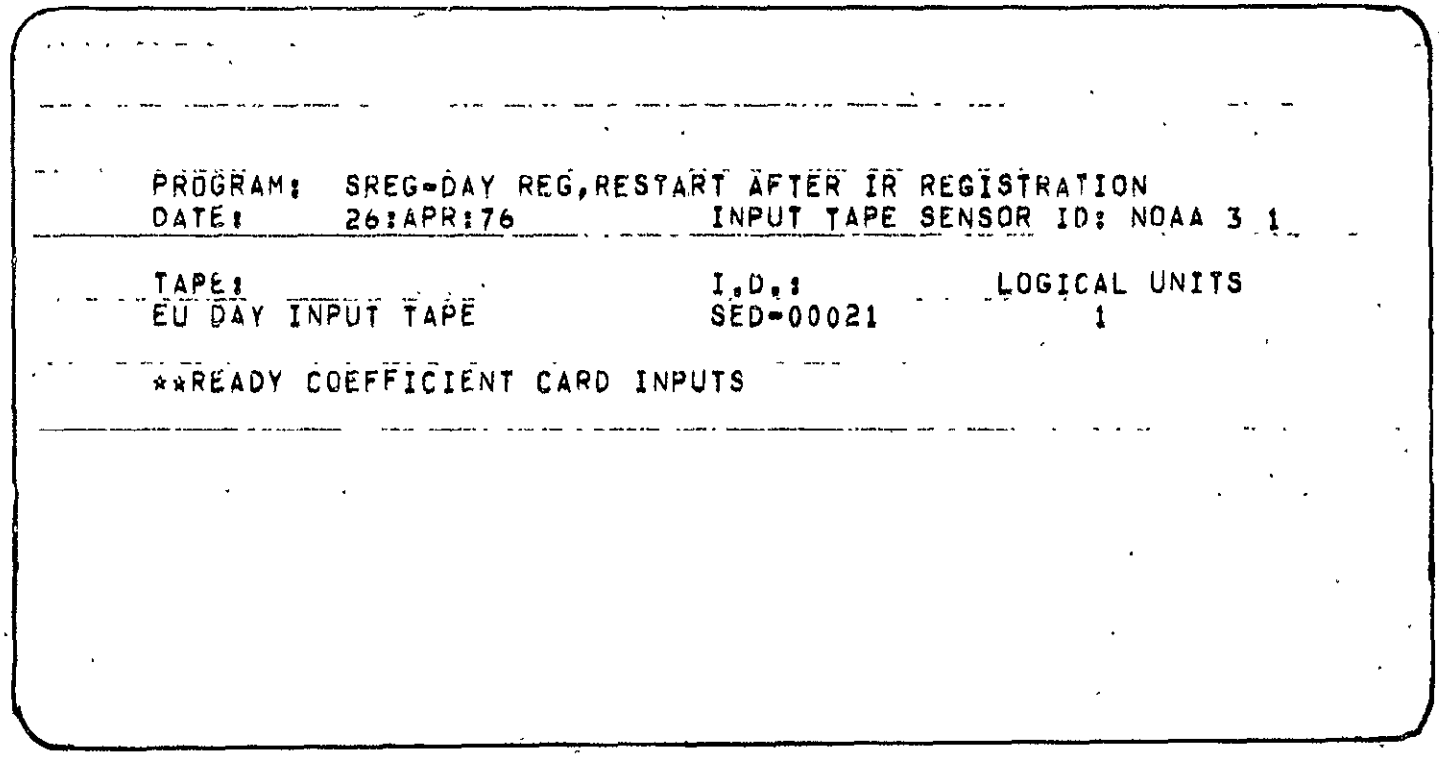


Figure 5-5 Day Restart Registration Processing Display

E. Verify that the registered disk containing the corresponding day IR channel is loaded on DK1; hit HOME tab to position to the command line; key in GO. A message is displayed to indicate that registration processing is in progress. The available commands during this phase (prior to the GO command) are:

- RST. Returns back to the registration initial display (figure 5-1). This can be used if the wrong processing mode was selected or the incorrect EU input tape mounted.

- ABT. Returns back to the SEDS initial display (figure 2-1).

5.5 NIGHT REGISTRATION OPTION

This option provides registration of an EU night tape with formatted IR data output to the registered disk file on DK1. There are selectable options of GCP screening or card inputs, registered IR output tape and isothermal output products. Either GCP screening or coefficients input from disk or cards is required for obtaining the mapping coefficients to be used in registering the night input image to the reference grid. The actual processing consists of two phases:

- Building a coarse rotated tape, essentially inverts the data to conform to a day image
- Input of the coarse rotated tape through IR channel registration pass to generate the night IR channel on the registered disk file (DK1).

During the creation of the coarse rotated tape, the background image disk as DK1 is required as a storage device. The data is compressed to disk, read back off the disk in reverse order and decompressed.

5.5.1 Configuration Setup. The configuration setup for normal night registration is outlined in figure 5-6. The amount of configuration required is determined by the options selected from the night registration processing display discussed below.

5.5.2 Operation Procedures. The following steps initialize the night registration option.

A. The night registration processing display is output to the VT05 screen (refer to figure 5-7). The display reflects the tape ID of the input tape so the operator can verify the correct tape is mounted.

B. By hitting the ALT key, the operator can position to the input fields denoted by an * on the VT05 display.

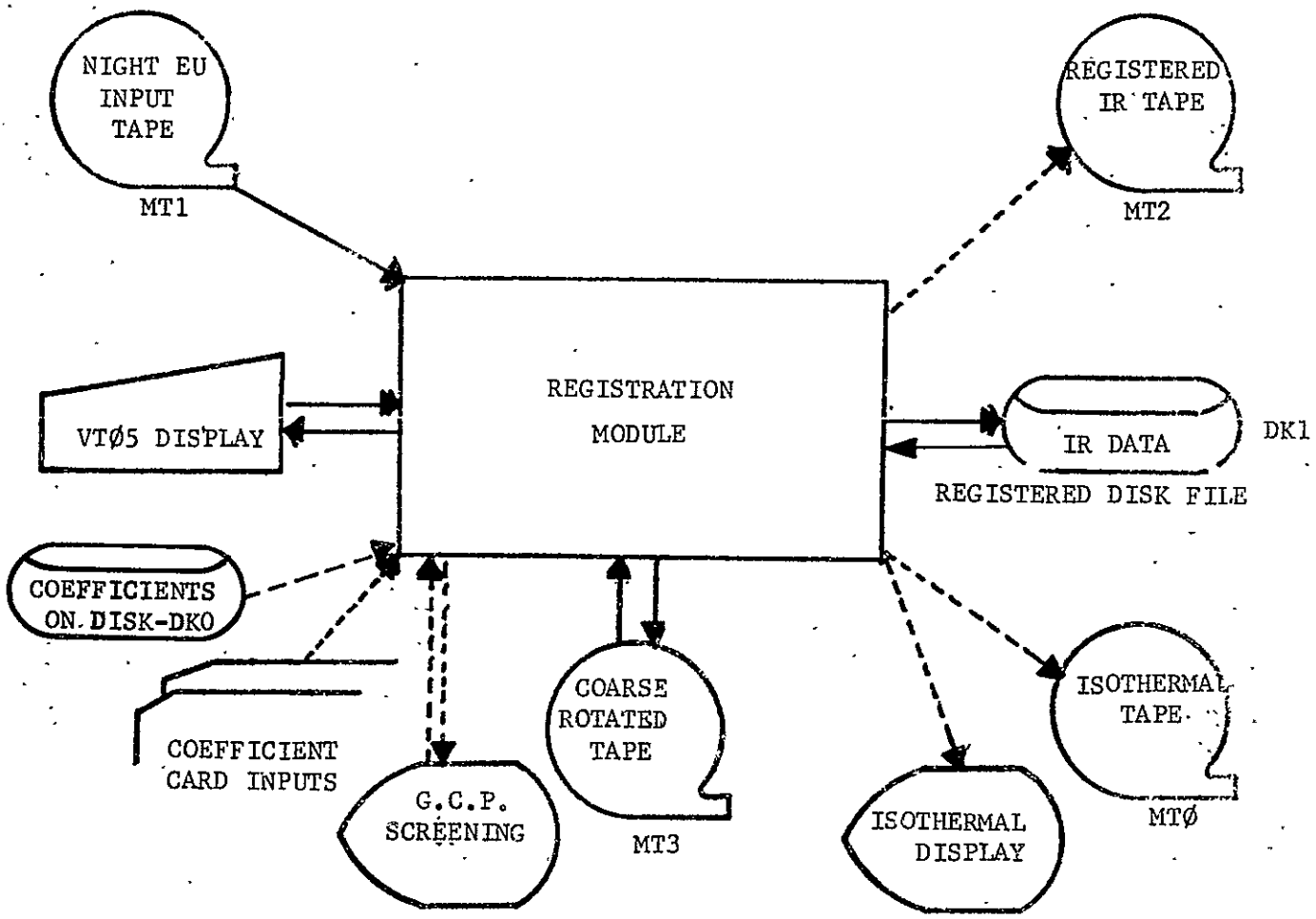


Figure 5-6 Normal Night Registration Configuration Setup

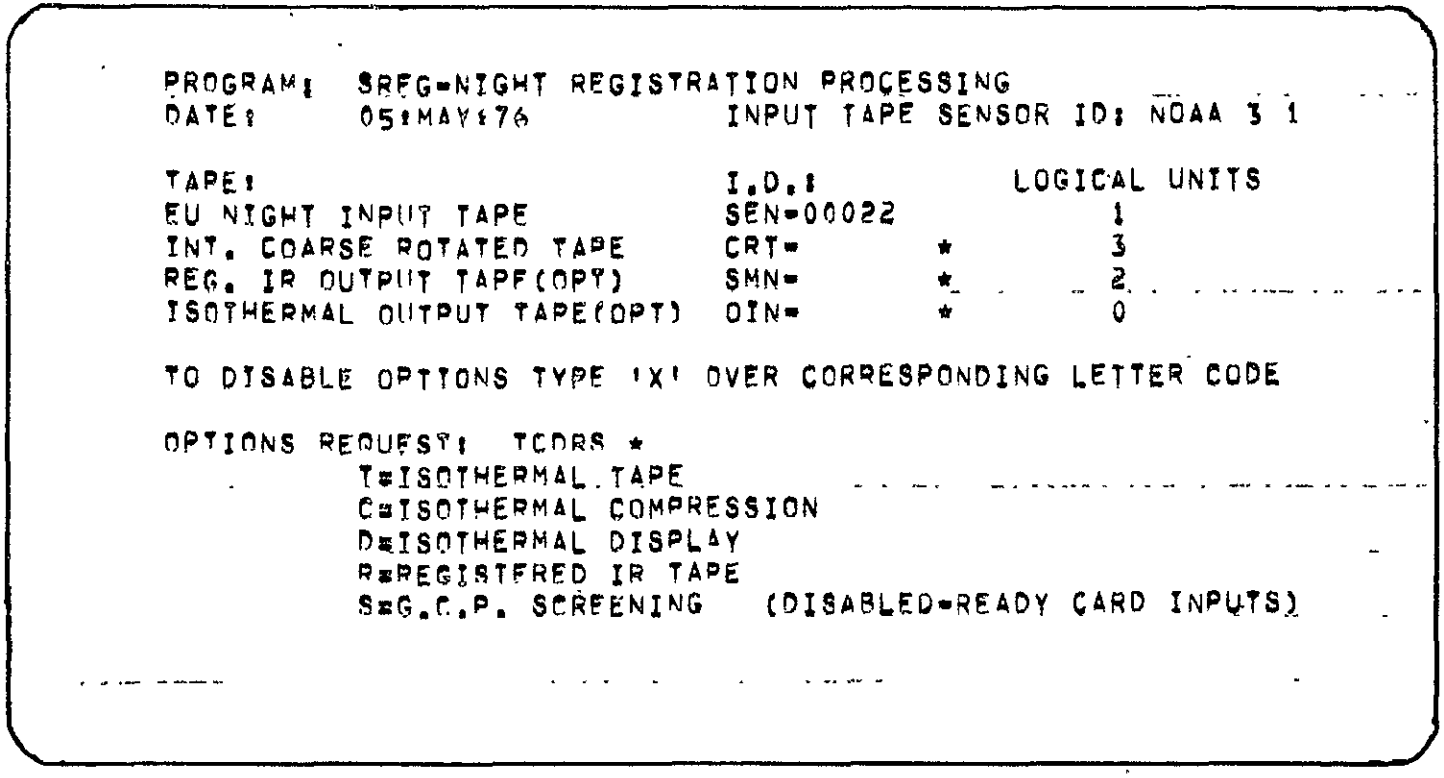


Figure 5-7 Night Registration Processing Display

C. Position to the tape ID field for the coarse rotated tape. The output tape ID mnemonic coarse rotated tape (CRT) comes up initially on the display. Enter a maximum of 6 characters (alpha or numeric) on the field to assign a tape ID number to be placed in the header record of the output tape.

D. Position to the tape ID fields for the registered IR tape and/or isothermal tape and repeat the above step if these optional output products are to be requested.

E. Position to the OPTIONS REQUEST field. This field initially comes up with the letter codes TCDRS. The code descriptions are immediately following on the display.

Key in an "X" over the letter code for those options not requested.

F. Hit HOME key to position to the command line; key in GO. At this point, if GCP screening option was selected the ground control point display is now output to the VT05. (Refer to paragraph 5.7, GCP Screening Procedures). If GCP screening was not selected, the operator must have the coefficient card inputs in the card reader for input to the registration module or use the coefficients saved on disk. Refer to paragraph 5.8, Registration (Card Inputs/Disk-Saved Coefficients).

The commands available during this phase (prior to the GO command) are:

- RST. Returns back to the registration initial display (figure 5-1). This can be used if the wrong processing mode was selected or the incorrect EU input tape was mounted.

- ABT. Returns back to the SEDS initial display (figure 2-1).

5.6 NIGHT RESTART REGISTRATION OPTION

This option provides the capability of starting up night registration after the coarse rotated tape has been built. This would prove useful should a system failure or any other constraint prevent normal completion of night registration. In this option mode the CRT is used as the input tape. The input IR channel data off the CRT tape is registered using card inputs or coefficients from disk providing the mapping coefficients derived in an earlier run. The registered IR channel is output to the registered disk file on DK1. There are selectable options of a registered IR output tape and isothermal output products.

5.6.1 Configuration Setup. The configuration setup for night restart registration is outlined in figure 5-8. The amount of configuration is determined by the options selected from the processing display:

5.6.2 Operation Procedures. The following steps initialize the night restart registration option.

A. The night restart processing display is output to the VT05 screen (refer to figure 5-9). The display reflects the input tape ID of the CRT tape so verification can be made that the correct tape is mounted.

B. By hitting the ALT key, the operator can position to the input fields denoted by an * on the VT05 display.

C. Position to the tape ID fields on the display for each output tape.

D. The output tape ID mnemonics (SMN,0IN) come up initially with the display background. The operator is to fill in a unique tape ID number for the registered IR and for isothermal tapes if these optional output products are requested. Enter a maximum of 6 (alpha or numeric) characters in the field to be placed as the tape ID number on the output tape header record.

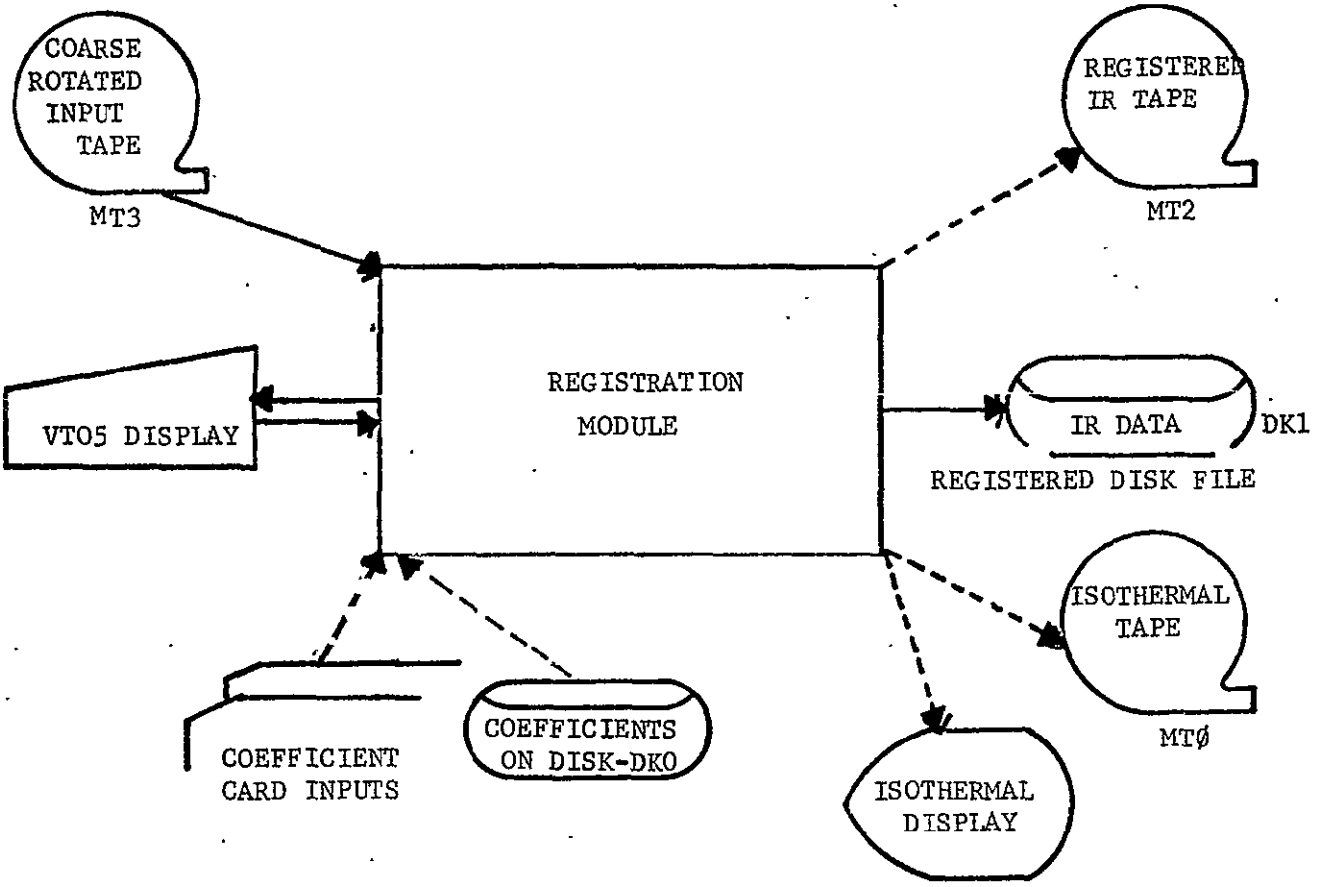


Figure 5-8 Night Restart Registration Configuration Setup

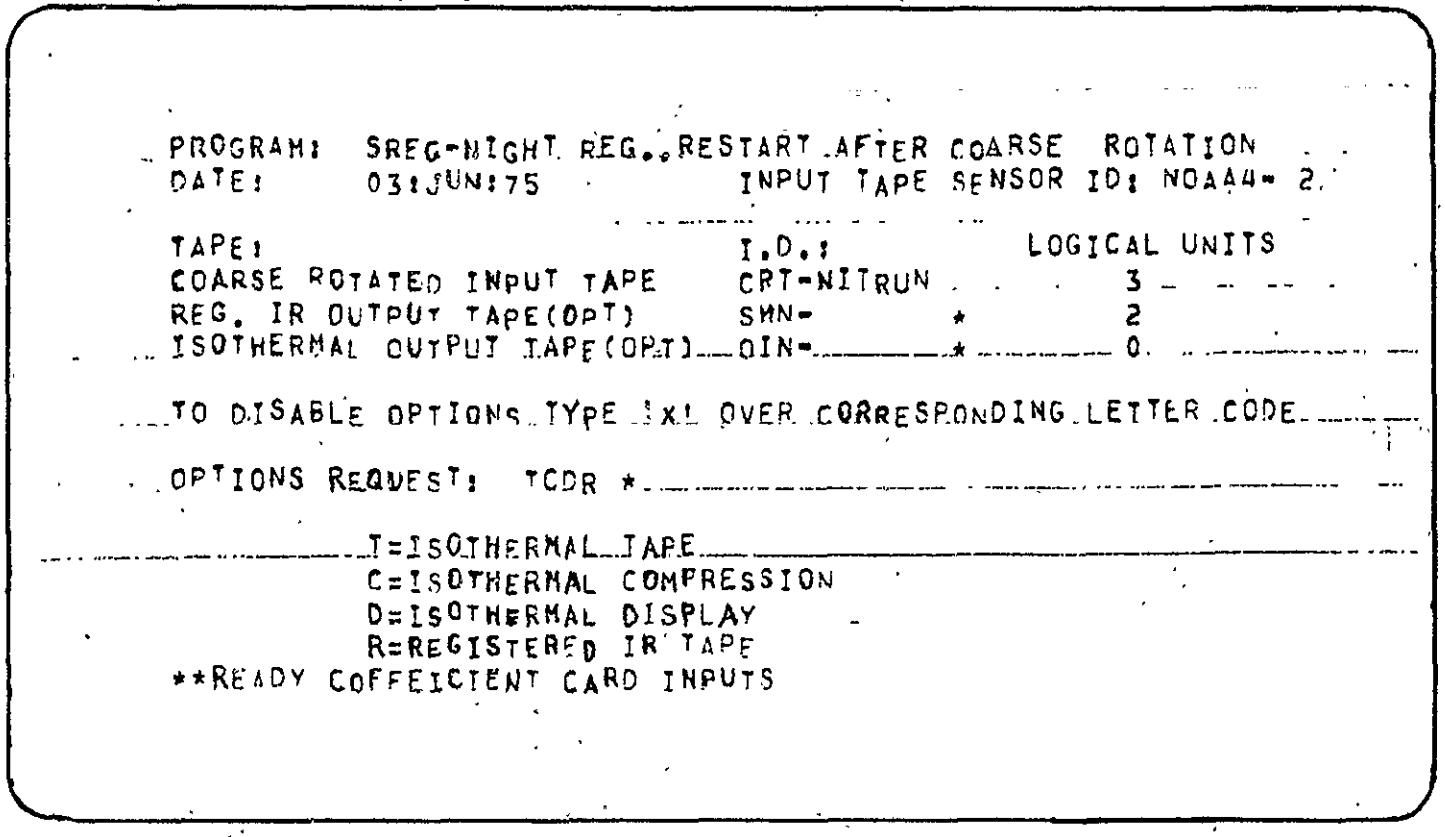


Figure 5-9 Night Restart Processing Display

E. Position to the OPTIONS REQUEST field. This field initially comes up with the letter codes TCDR *. The code descriptions are immediately following on the VT05 display. Key in an "X" over the letter code for those options not requested.

F. The operator can use card units or the coefficients saved on disk. To use disk-saved coefficients, refer to paragraph 5.8. The operator places the coefficient card inputs for this run in the card reader hopper with the RESET button depressed. The coefficients obtained through GCP screening from the terminated night run for this job must be used for this pass. These coefficients are printed on the tabout at the end of GCP screening.

G. Hit HOME tab to position to the command line; key in GO.

H. The card inputs are read in and a tabout of the input (figure 5-14) is output to the line printer.

I. A message notifying the operator to mount disk on DK1; is output to the VT05.

J. Verify that the background image disk for building the registered disk files is loaded on DK1. Hit HOME tab to position to the command line; key in GO.

K. A message is displayed to indicate that registration processing is in progress.

The available commands during this phase prior to the GO command are:

- RST. Returns back to the registration initial display (figure 5-1). This can be used if the wrong processing mode was selected or the incorrect CRT tape was mounted.

- ABT. Returns back to the SEDS initial display (figure 2-1). Any current processing is terminated.

5.7 GCP SCREENING PROCEDURES

The GCP screening phase is for the purpose of screening an input tape image to identify preassigned GCP's. This process provides a means of deriving mapping coefficients for the translation, scaling, and rotation required to register an image to the SEDS reference grid.

5.7.1 GCP Display. The GCP display serves two purposes; 1) accepts inputs for initialization and control of GCP screening and deletion of already identified points and 2) displays and updates information and GCP statistics for operator viewing. Figures 5-10 and 5-11 are examples of the GCP display. Figure 5-11 is after several points have been identified via the ICD thumbwheel. Following are explanations of each entry by number codes.

A. (1) STSCN, Start Scan Line. This entry is input by the operator to designate at what scan line to begin data transfer to the ICD during screening for ground control points.

B. (2) SPSCN, Stop Scan Line. This entry is optional. The operator can input a value to designate the scan line at which to halt data transfer to the ICD during screening for GCP. If left blank, a maximum default value is assigned.

C. (3) STPIX, Start Pixel. This entry is input by the operator to designate at which pixel within each scan line to begin transfer of data to the ICD screen. There is no default value so this input must be made relative to entry number (5) as the first pixel on the tape.

D. (4) TIMEOUTS. This counter is updated by the display module when on a data transfer to the ICD a display failure timeout status is received. This indicates that the transfer was held up and took longer than the allotted time.

E. (5) TAPE START PIXEL. When the header is read off the input tape the GCP module displays here the start pixel on the tape (as recorded in the header). Example: the value displayed is 1000, then the very first pixel of each scan on the tape is pixel no. 1000. Therefore, if on screening, you want to start at the very first of the data, input 1000 at entry number (3), STPIX as start pixel number.

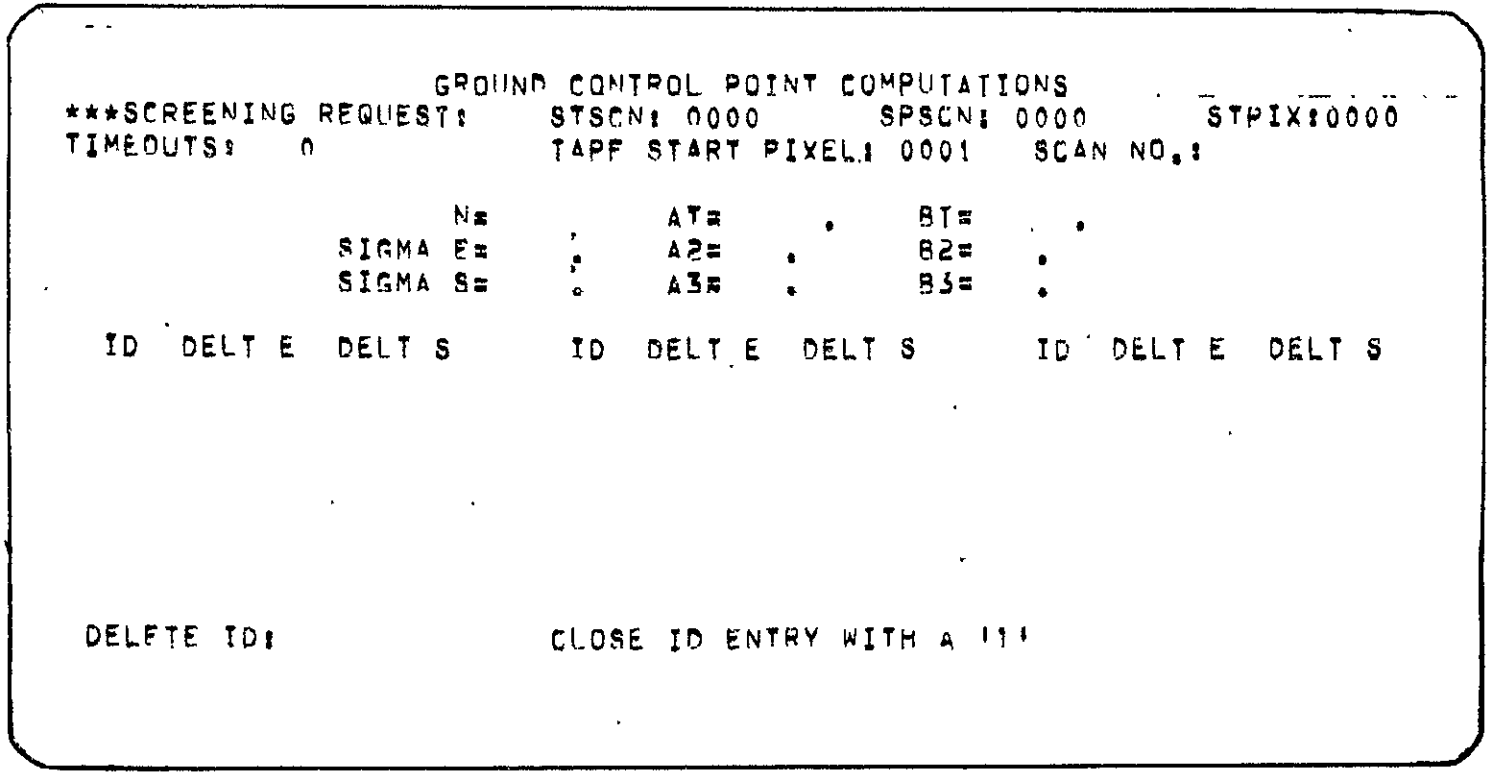


Figure 5-10 Example One of the GCP Display

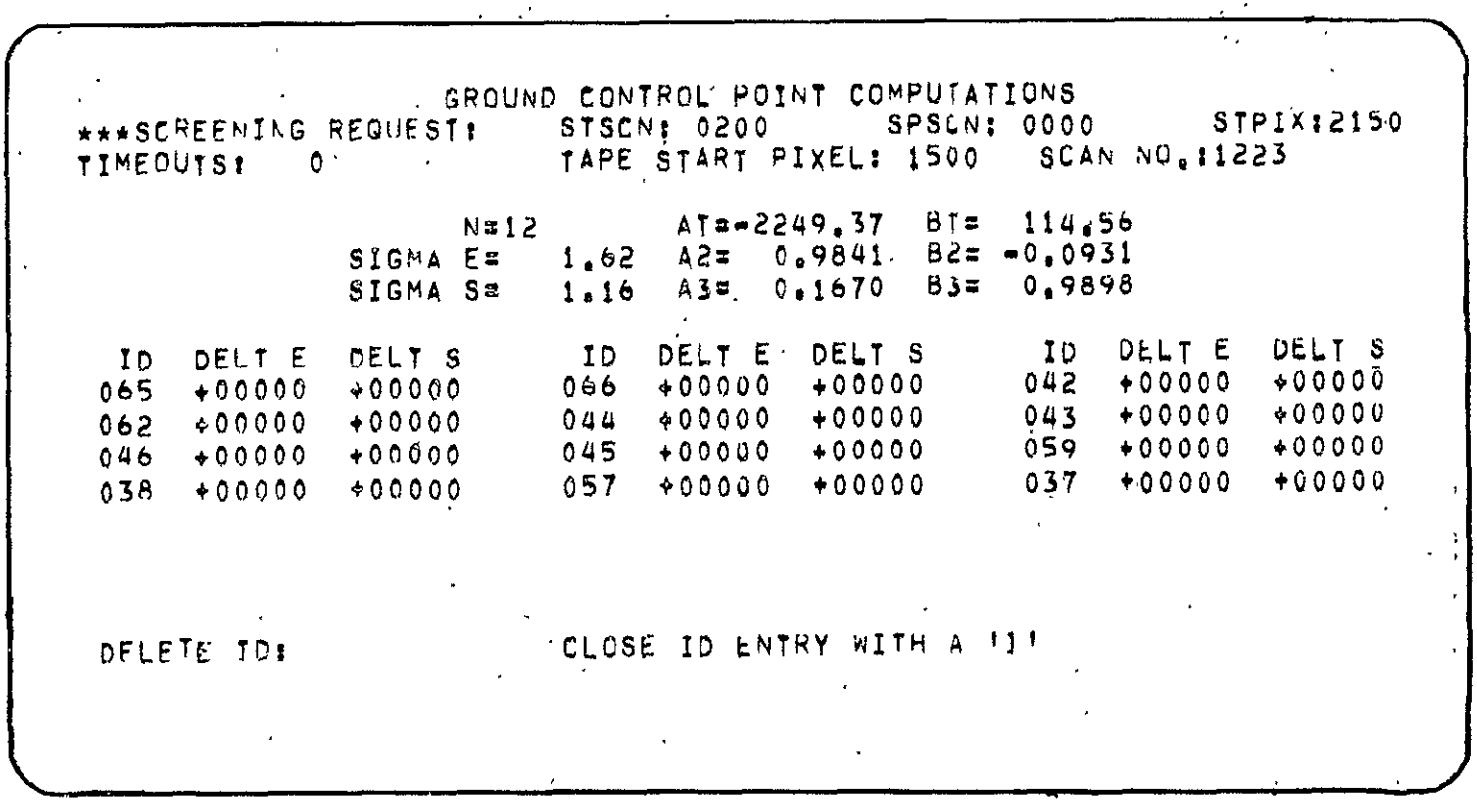


Figure 5-11 Example Two of the GCP Display

F. (6) SCAN NO. This entry is updated by the GCP module as each scan line is output to the ICD screen. It always reflects the current scan line so the operator knows where he is in the image during the GCP screening.

The following entries are output by the GCP module each time a point is identified or deleted.

G. (7) N. This is updated to reflect the number of GCP's that have been identified.

H. (8) SIGMA E/SIGMA S. These represent the average error deltas of the elements (E) and scans (S) of those GCP's identified. The values can fall in the 0-10 range and still indicate a relatively good relationship of the points selected. The individual SIGMA E, SIGMA S will increase drastically when a point has been identified way off course.

I. (9) AT, A2, A3, BT, B2, B3. The numbers A2, A3, B2, and B3, along with A1 and B1 which are not displayed, are the coefficients for the transformation of E,S onto X,Y calculated as each new GCP is entered via the ICD thumbwheel. These are used to compute the RA1, RA2, ... RB3 mapping coefficients for the inverse transformation of the registered image (X,Y) onto the input image (E,S). As more GCP's are located, all six numbers should stabilize. In particular, if not enough GCP can be found or if they have poor distribution, (i.e., less than 10 points or without good triangulation) any or all of A2, A3, B2 or B3 can be replaced with predicted coefficients via card input or VT05. Under these conditions replace a coefficient if it is more than ±.01 from the predicted. Never replace a coefficient if you have located many GCP's and have good distribution. The numbers AT and BT (the T denoting translation) give the location that the point (0, 0) in the input image would be located in the reference grid when registered. When sufficient GCP's are located, AT and BT should not vary more than a few integers. AT and BT are displayed only as operator aids. They are not used as registration coefficients.

J. (10) ID DELT E DELT S. The DELT E and DELT S reflect the relationship of the entered points with fitted values. If three or fewer GCP's are entered, the delta E and delta S are comparisons of the entered locations with ephemeris data. For four or more GCP's, it is a comparison of the entered locations with the calculated locations based on the calculated coefficients. Thus, in no case do the delta E and delta S represent an absolute error or deviation from a known location. If the calculated value of delta E or delta S is between ±10, then zero is shown. The calculated value of delta E or delta S is displayed only if it exceeds ±10. The delta E and delta S values can sometimes be used to determine how a GCP has been mislocated. As a rule of thumb, if delta E is negative look toward the left of the display for the GCP you have mislocated. If delta E is positive, look toward the right; if delta S is negative, look toward the bottom; if delta S is positive, look toward the top of the display for the real location of the GCP.

K. (11) DELETE ID. This is an operator input field. Here the operator keys in the ID number of the ground control point he wishes to delete. The field consists of 2 digits (right justified) and must be closed with a right bracket (]) to indicate end of input.

5.7.2 Operation Procedures. The following procedures initiate screening of the input tape, identify GCP's and operator controls, and terminate the GCP phase.

A. To initiate screening of the input tape, the following steps are performed:

1. The GCP display has been previously output to the VT05 screen. An explanation of the display is given in paragraph 5.7.1.

2. The header on the input tape is read and the start pixel number on the tape is taken from the header and displayed as TAPE START PIXEL. This reflects the pixel number of the first pixel of each scan on the tape.

3. By hitting the ALT key, the operator can position to the input fields on the display.

4. Position to the start scan entry (STSCN:) on the display. The operator inputs here the scan at which he wants to begin screening.

5. Position to the stop scan entry (SPSCN:) on the display. This entry is optional. The operator can input the scan at which he wants to stop screening. If no input is made, a default value of maximum scan number is set up.

6. Position to the start pixel entry (STPIX) on the display. The operator inputs here the pixel within each scan at which he wants to begin data transfer to the ICD during screening.

7. After completing the above inputs, hit HOME tab to position to the command line; key in GO to begin the screening phase.

8. When the requested start scan is reached on the tape the data will then be transferred to the interactive display for viewing.

B. The procedures for the actual identification of GCP's and operator controls via the ICD and VT05 during this phase follow.

1. To identify a GCP the operator must temporarily halt the screening of the image. This is done by dialing up [0,0] on the ICD thumbwheel and depressing the INTERRUPT button. Data transfer is suspended to allow the operator to locate the GCP's from the area displayed.

2. When a GCP is visually located, position the display cursor (an 8-position joystick) over the point desired. The inner half line portion of the cursor grid should be directly under the GCP to be identified.

3. Each predetermined GCP is assigned a unique ID number. Refer to appendix A for the list of GCP's available to date and their ID.

4. On the ICD thumbwheel dial in the ID number of the GCP and depress the INTERRUPT button.

5. The coordinates of the point selected (E,S) are compared internally to a pre-calculated X,Y for that particular GCP. Delta errors and the mapping coefficients are computed using the GCP input.

6. After a GCP is identified and a fit performed, quality indicators (delta errors) will be displayed on the GCP display (figure 5-11). The coefficients are recalculated and also refreshed on the display. This gives the operator opportunity to change an incorrectly identified point and a means of determining when a sufficient number of points have been located. Refer to paragraph 5.7.1 for an explanation of the statistics displayed after each point is identified.

7. Steps 2-6 are repeated for each GCP that is identified.

8. To continue screening the image from where it was previously halted, key in CON <CR> on the VT05 or dial up [9,9] on the thumbwheel, depress INTERRUPT button.

9. If the operator wants to continue screening from where it halted but needs to move the image to the left or right from the area displayed, input a new start pixel entry (STPIX) on the VT05 and do step 8 above.

10. To view a new area on the tape, make the desired inputs to STSCN, SPSCN and STPIX on the VT05 display. Then position the cursor to the command line on the VT05; key in GO.

11. If any GCP selected shows up on the display as being way off or for some reason the operator decides not to use this point, he can delete the entry. Position to the bottom line to DELETE ID: by hitting the ALT key. Key in the ID number of the GCP to be deleted followed by a right bracket (]). The display will update to reflect the deletion of the GCP.

C. Procedures for terminating the GCP phase when the operator is ready to register the data follow. This is the case when identification of GCP's has been completed.

1. Hit HOME tab to position to the command line; key in END. A message is output to the VT05: "**NEED TO CHANGE REGISTRATION COEFFICIENTS?"

2. Reply with a YES or NO on the command line.

3. If the DPCA keyed in 'NO':

   The coefficients as calculated during the GCP phase are written out to the REGCOF disk file. The program continues by outputting the message:

   "MOUNT DISK ON DK1 FOR REG.; ENTER 'GO'"

4. If the data production control analyst (DPCA) keyed in YES, the coefficients as calculated during the GCP phase are displayed on the VT05. The DPCA can visually check the values and make changes to the coefficents as necessary. Those fields capable of operator input/change are denoted with an *.

5. Key in GO to indicate all changes have been made and ready to proceed. The coefficients are written out to the REGCOF disk file, a tabout of the coefficients is printed to the line printer. The program continues by outputting the message: "MOUNT DISK ON DK1 FOR REF.; ENTER 'GO'".

5.7.3 GCP Tabout. At the conclusion of the GCP phase (after entering the END command) a tabout is printed to the line printer. It contains job information as well as GCP statistics from identifying predefined points in the image, or if no points were identified, statistics based on ephemeris data. Figure 5-12 is a sample GCP tabout that was the result of identifying the points as shown in the GCP display (figure 5-11). Should a job be restarted, it is from this tabout that the information is taken for the card inputs (see paragraph 5.8). Those entries marked by a number code in figure 5-12 are used to input on the cards for a restart. The

*****INPUT IMAGE COORDINATES*****

DATE: 28-MAY75 PAGE 1

TIME: 00:30:24

ORBIT NO: 2341 DAY PASS

START TAPE TIME (DAY-MON-JR HRS:MIN:SEC):05-21-75 16:06:30

E= 990 S= 2200
X= 49 Y= 2374
LAT= 0.3580511E 02
LON= -0.1105305E 03

E= 3490 S= 2200
X= 2530 Y= 2300
LAT= 0.3047401E 02
LON= -0.8803567E 02

E= 2240 S= 1100
X= 1179 Y= 1241
LAT= 0.2522638E 02
LON= -0.1023314E 03

E= 990 S= 1
X= -171 Y= 182
LAT= 0.1876491E 02
LON= -0.1153735E 03

*

E= 3490 S= 1
X= 2310 Y= 108
LAT= 0.1423419E 02
LON= -0.9541114E 02

Figure 5-12 GCP Tabout

*****GROUND CONTROL POINT LOCATION TABULATIONS*****

DATE: 28-MAY75 PAGE: 2

TIME: 01:22:47

ORBIT NO. 2341 DAY PASS

START TAPE TIME (DAY-MON-YR HRS:MIN:SEC):05-21-75 16:06:30

MAPPING COEFFICIENTS:

A1= 426.74658 A2= 0.99334663 A3= 0.102430373 RA1= -290.89175 RA2= 1.00390530 RA3=-0.1033867

B1= 1330.16443 B2=-0.026832307 B3= 0.99461871 RB1= -1345.20862 RB2= 0.027082834 RB3= 1.002621

ARCTAN A3= 5.848431 ARCTAN B2= -1.537009 DVALUE= 0.18948540E 12 OFFSET= 767.36

DEVIATION= 421.75 EBAR= 1475.57141 SBAR= 1167.00000 XBAR= 426.74658 YBAR= 1330.16443

NO. OF GROUND CONTROL POINTS IDENTIFIED: 7

ID	E INPUT IMAGE	S	E ERROR	S ERROR	COMBINED ERROR
43	1003.0	1301.0	-1.9096	-0.1475	1.9153
46	1038.0	1294.0	1.9976	0.6119	2.0892
51	1455.0	970.0	-1.7960	-0.9086	2.0128
38	1326.0	874.0	1.3268	0.1942	1.3409
49	1801.0	1296.0	0.1376	-0.9757	0.9854
48	1771.0	1367.0	0.1461	0.2281	0.2709
50	1935.0	1067.0	0.0981	0.9980	1.0029

SIGMA E= 1.4533SIGMA S= 0.7371SIGMA COMBINED= 1.6295

Figure 5-12 (Cont'd)

first page of the printout contains the coordinates of the four corners and center of the input image reflected as E,S and the four corners and center of the reference grid, reflected as X,Y, as defined by the fit performed on the input image. The corresponding latitude and longitudes are also given for each E,S point. The second page of the printout contains the following:

A. Mapping coefficients (Forward and Inverse Transformation)

1. A_1 is a part of the translation of the image. This value is not expected to stabilize.

2. A_2 is a scale factor in the pixel (E) direction. This value should be close to 1 (.95 - 1.05). A compression in the pixel direction is represented by <1. A stretch in the pixel direction is represented by >1.

3. A_3 is the vertical skew factor. If A_3 is positive (+), the registered image is skewed to the right. If A_3 is negative (-), the registered image is skewed to the left. The value should stabilize to near 0.

4. B_1 is a part of the translation of the image.

5. B_2 is the rotation from the horizontal. If B_2 is positive (+), horizontal lines in the registered image are rotated counter clockwise. If B_2 is negative (-), horizontal lines in the registered image are rotated clockwise.

Mapping coefficients (forward and inverse transformation).

B_2

Examples of approximate rotation:

B_2 Equals	Degrees Rotation
0.0	0°
0.01	0.57°
0.05	2.9°
0.02	1.15°
0.2	11°

6. B_3 is the scale factor in the down track direction. This value should be close to 1 (0.95 - 1.05). A compression in the down track direction is represented by <1. A stretch in the down track direction is represented by >1. For example, B_3 = 0.95 will result in about 5 percent of the scan lines deleted in the registered image. B_3 = 1.05 will result in about 5 percent of the scan lines repeated in the registered image.

7. RA1, RA2, ... RB2, and RB3 are the corresponding mapping coefficients for the inverse transformation.

B. Arctan A_3. Arctan A_3 is approximately the angle, measured in degrees, of vertical skew. A positive angle will result in a registered image skewed clockwise and a negative angle will result in a registered image skewed counterclockwise.

C. Arctan B_2. Arctan B_2 is approximately the angle, measured in degrees of horizontal rotation. A positive angle will result in a registered image rotated counterclockwise and a negative angle will result in a registered image rotated clockwise.

D. DVALUE. DVALUE is a measure of linear independence of the GCP's. If the GCP's are all in a line, DVALUE is smaller than if they are dispersed.

E. OFFSET. OFFSET is a measure of the distance of the average of the GCP's (EBAR, SBAR) from the center of the input image.

F. DEVIATION. DEVIATION is a measure of the spread of the GCP's.

G. EBAR. EBAR is the average pixel element (E) in the input image of the GCP's identified. This will be mapped during the registering of the data onto the corresponding point XBAR which is the average pixel of the points selected as defined in the reference grid.

H. SBAR. SBAR is the average scan line (S) in the input image of the input GCP's identified. This will be mapped during the registering of the data onto the corresponding point YBAR which is the average scan of the points selected as defined in the reference grid.

I. XBAR. This is the value obtained by taking the average of the X coordinates in the reference grid corresponding to the GCP's identified from the input image.

J. YBAR. This is the value obtained by taking the average of the Y coordinates in the reference grid corresponding to the GCP's identified from the input image.

K. The remainder of the printout (second page) reflects the GCP's identified giving the E,S coordinate of the point as selected from the input image, the E&S errors of each point identified, along with a combined error. The SIGMA E and SIGMA S are the averages of the E errors and S errors respectively of the GCP's identified. SIGMA COMBINED is the average of the sum of the E errors and S errors combined.

5.8 REGISTRATION (CARD INPUTS OR DISK-SAVED COEFFICIENTS)

Registration of an input tape can be accomplished by using card inputs containing the mapping coefficients obtained during GCP screening, or accessing the disk file with the most recent coefficients saved. Therefore, if a run had to be terminated prior to completion but after the GCP screening or a job had to be completely rerun, it is not necessary to repeat the actual screening and identifying of points during the rerun. All four processing modes allow the operator to utilize these options to register the data without reidentifying points. Options 2 and 4 (Day Restart and Night Restart) are available modes for the purpose of having to restart a job at a particular point after GCP screening, and therefore expect card inputs or retrieval of coefficients stored on disk.

5.8.1 Coefficient Card Inputs - Card Format. The information put in via card inputs is taken directly from the GCP tabout received on the line printer at the completion of the GCP phase. (Refer to figure 5-12 and paragraph 5.7.3 GCP tabout.) This printout contains the mapping coefficients calculated from selecting/identifying GCP's in the input image. Figure 5-13 is a sample card deck layout showing the card sequence and data formats of each card. The sample card deck and sample GCP tabout contain number codes next to the corresponding entries to be used from the tabout for the card inputs. A breakdown of each card and its contents follows.

CARD A

Column	Contents
10-19	Current date (any format)
30-39	Job information (anything can be put here, i.e., day pass, night pass, orbit number, etc.)
40-41	Number of GCP's (must be right justified)

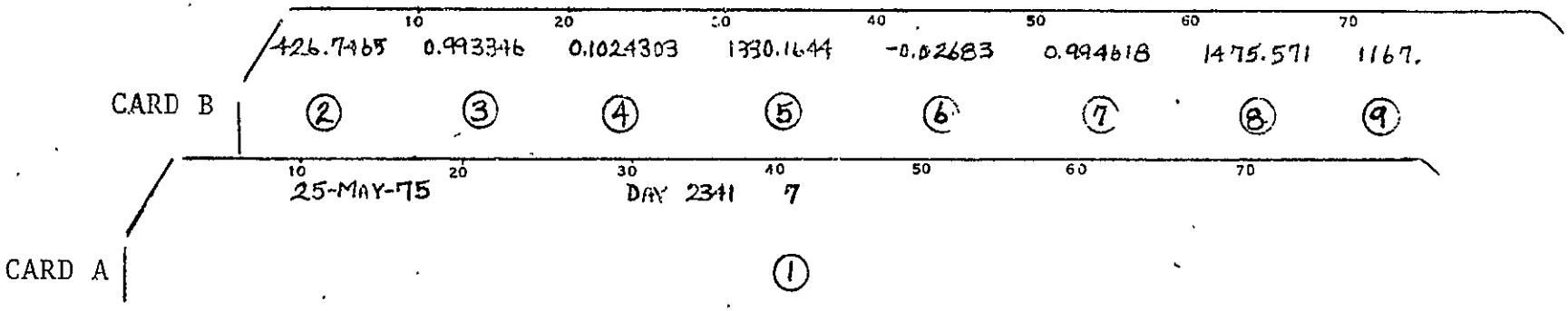


Figure 5-13 Coefficient Card Deck

CARD B

Column	Contents
1-10	A1 Coefficient
11-20	A2 Coefficient
21-30	A3 Coefficient
31-40	B1 Coefficient
41-50	B2 Coefficient
51-60	B3 Coefficient
61-70	EBAR
71-80	SBAR

On card B, punch only as many digits as will fit in the ten allotted columns. The input does not have to be right or left justified. For example, if the GCP tabout gives A3 = -0.103386745 punch it as -0.1033867. If the input is an integer value (i.e., 1250) it must be followed by a decimal point (i.e., 1250.) The following are operation procedures for card inputs.

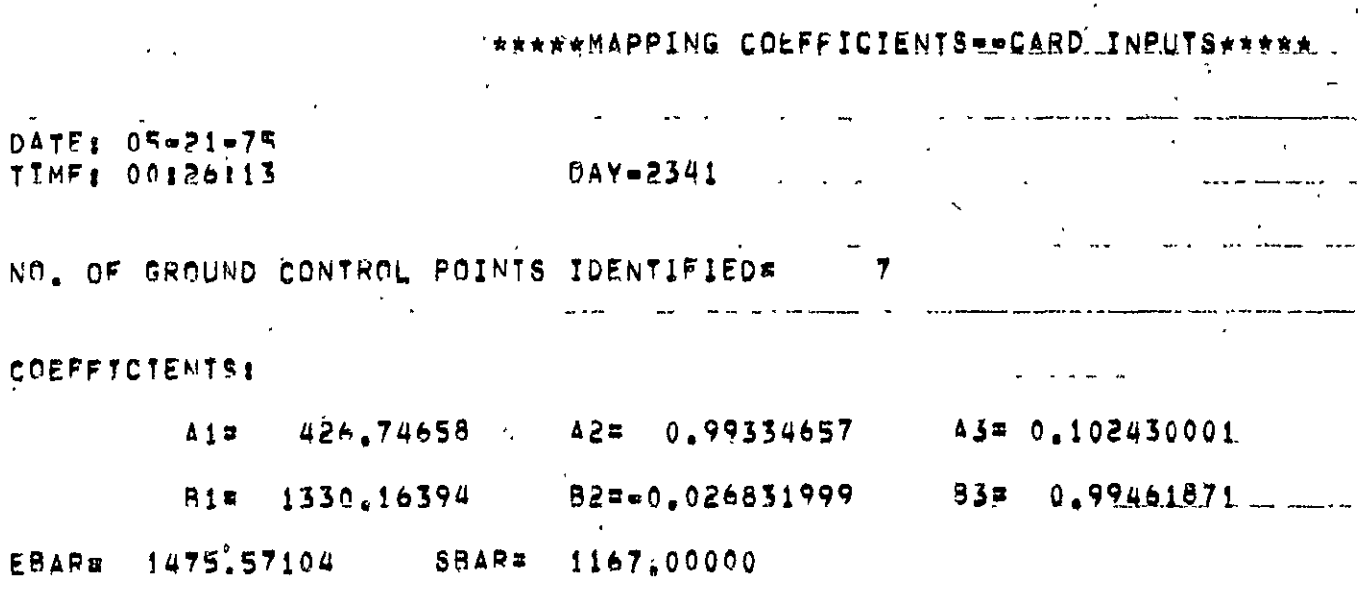
A. All necessary inputs at this point have been made to the selected processing option display (see paragraphs 5.3 and 5.6) and in this case the code for GCP screening in the OPTION field on the VT05 has been X'ed out.

B. Place cards in card reader hopper; depress RESET button.

C. Key in GO at the command line.

D. The following message will be displayed on the VT05: "**NEED TO USE REG. COEFFICIENTS FROM DISK?" Reply with a NO on the command line.

E. The cards are read in; a tab of the inputs is printed to the line printer (figure 5-14).



```
*****MAPPING COEFFICIENTS--CARD INPUTS*****

DATE: 05-21-75
TIME: 00:26:13                    DAY=2341

NO. OF GROUND CONTROL POINTS IDENTIFIED=     7

COEFFICIENTS:

          A1=   424.74658      A2=  0.99334657      A3= 0.102430001

          B1=  1330.16394      B2=-0.026831999      B3=  0.99461871

EBAR=  1475.57104      SBAR=  1167.00000
```

Figure 5-14 Mapping Coefficients - Card Inputs

F. A message informing operator to have the disk loaded on DK1 is output to the VT05.

G. Hit HOME tab to position to the command line; key in GO.

H. A message is then displayed that registration processing is in progress.

5.8.2 Disk-Saved Coefficients. The coefficients used in a particular run, whether read in on cards or calculated during GCP phase, along with the orbit number will be saved in the REGCOF file on the production disk. Only the previous day and night coefficients can be recalled. Once a new job is run its coefficients are saved in place of the ones already stored on disk. The operating procedures for retreiving the coefficient off disk to use in a registration run follow.

A. The processing display where the tape ID numbers and the OPTIONS field TCDRS are input is now displayed. As the usual procedure, "X" out the S indicating by-pass GCP screening. Key in GO after inputs have been made.

B. The following message will be displayed on the VT05: "**NEED TO USE REG. COEFFICIENTS FROM DISK?" Reply with a YES or NO on the command line.

C. If the DPCA keyed in NO, the program assumes card inputs are to be read in. The cards are read in, a tabout of the inputs is printed to the line printer, and the coefficients are written out to disk for storage. The program continues.

D. If the DPCA keyed in YES, the program searches the disk file checking the day or night file for the orbit number corresponding to the restart run.

E. If the corresponding orbit number cannot be found, the following messages are output to the VT05. "**COEFFICIENTS FOR ORBIT NOT AVAILABLE ON DISK"--"ENTER 'GO' TO READ COEF. CARD INPUTS - 'ABT' TO ABORT OR 'RST' TO MOUNT NEW TAPE AND RESTART"

- GO. Have card inputs punched up and ready to be read into the system as in a normal card restart

- ABT. Returns to the SEDS initial display

- RST. Possibly the wrong input tape was selected so the orbit numbers do not compare. Returns to the registration initial display (figure 5-1). Select new processing option after mounting correct tape.

F. If the corresponding orbit number is found in the REGCOF disk file, a display of the stored coefficients is output to the VT05 (figure 5-15). The DPCA can visually check the values and make changes to any of the coefficients as necessary. Those fields capable of operator input/change are denoted with an *. Key in GO to indicate that the coefficients are correct and ready to proceed. The coefficients as displayed, to be used in registering the data, are written back out to the disk file and a tabout of the coefficients is printed to the line printer (figure 5-16). The program proceeds by outputting the message: "MOUNT DISK ON DK1 FOR REG.;ENTER 'GO'".

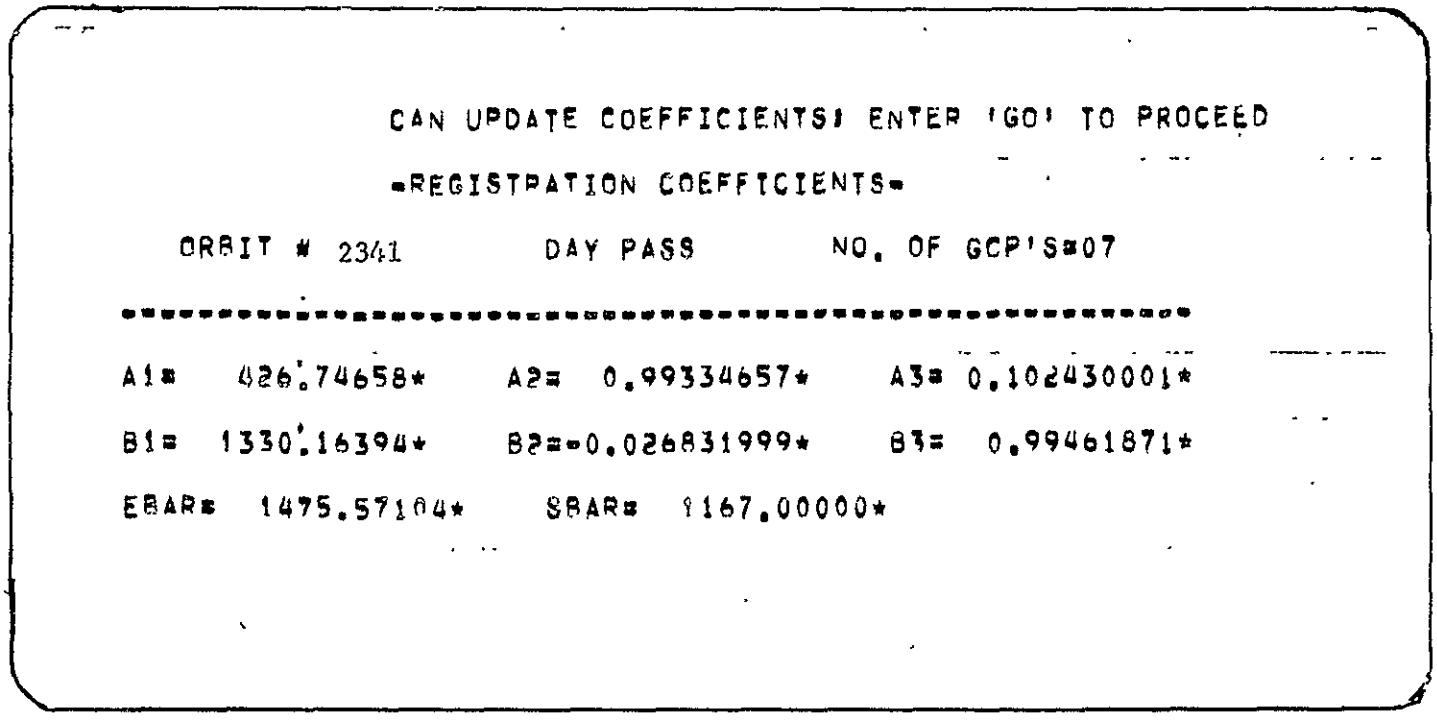


Figure 5-15 Stored Coefficients

*****REGISTRATION COEFFICIENTS*****

*AS READ IN FROM DISK FILE /R UPDATED VIA THE VTOS AFTER G.C.P. PHASE

ORBIT NO.: 2341
DAY PASS
NO. OF GROUND CONTROL POINTS IDENTIFIED=

MAPPING COEFFICIENTS:

A1=	426.74658	A2=	0.99334657	A3=	0.102430001	RA1=	-290.89233	RA2= 1.00390530	RA3=-0.103386372
B1=	1330.16394	B2=-0.026831999		B3=	0.99461871	RB1=	-1345.20813	RB2= 0.027082525	RB3= 1.00262129

FBAR= 1475.57104 SBAR= 1167.00000 XBAR= 426.74658 YBAR= 1330.16394

Figure 5-16 Registration Coefficients

5.9 ISOTHERMAL OUTPUT PRODUCTS

During registration processing, the option is available to build a 3-channel isothermal tape and to display the 3-channel isothermal color on the ICD unit. The operator can select to compress the output if so desired. The product generation isothermal display is output to the VT05 screen at the beginning of the actual registration phase of the data. Figure 5-17 is a sample copy of the display. All information is intialized as shown on the sample display and it should not be necessary to change any of the entries. However, the operator can input to or change the following input fields.

A. (1) Enter current date if not initialized.

B. (2) MODE indicates the type of output. If tape and display output was selected in the processing displays (discussed in paragraphs 5.3 through 5.6) and only tape output is now desired, the MODE entry can be changed to (2).

C. (3) False color table entry indicates the false color table to be used for the image. Now, isothermal output can use tables 3 or 4.

D. (4) & (5) The coefficients used to compute the color range to be used from the false color table. The initialized coefficients should provide a wide enough range to allow detailed color contrast.

E. (6) TAPE NO entry is initialized from the input by the operator in the processing display for the isothermal output tape number. However, this entry may not have been made previously or the operator wishes to change the input now.

F. (7) ORBIT NO entry is taken from the header of the input tape. If not available, the operator may make the correct input.

G. (8) DATE OF DATA is month, day, year of the orbit run for this data.

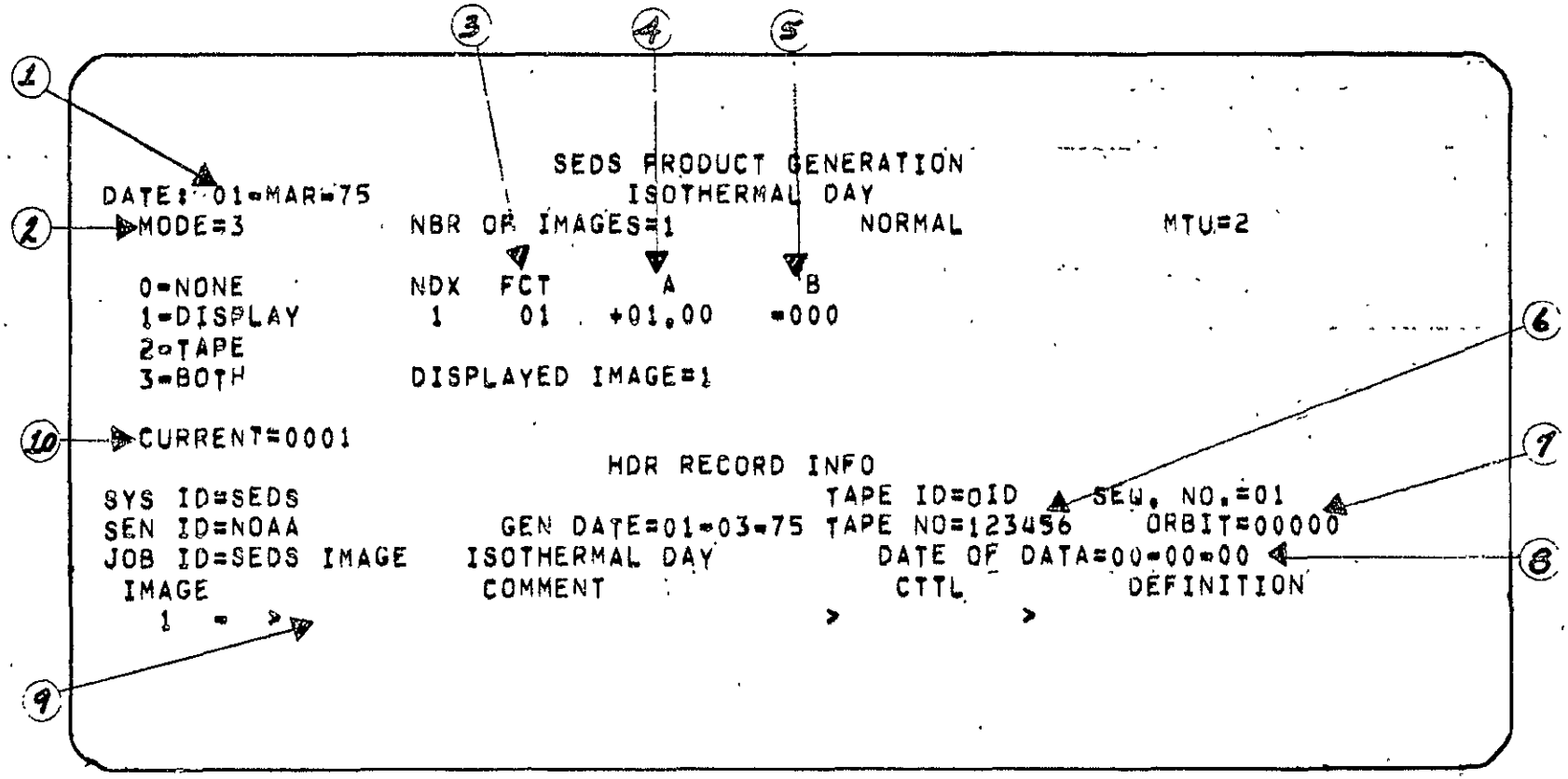


Figure 5-17 Product Generation Isothermal Display

H. (9) This is an input field for comments the operator may enter to distinguish the run. This information is put in the header of the isothermal output tape.

I. (10) CURRENT reflects the current scan line count being output.

After making any inputs to the product generation display, hit HOME key to position to command line; key in GO. Registration will continue with output of the selected isothermal products.

5.10 ZERO-FILL BYPASS CAPABILITY IN REGISTRATION

A feature to bypass the registration processing of zero-fill data at the end of an input image has been implemented into the registration phase. This will enable, when zero-fill is detected, discontinuing reading in of the input tape and going through the lengthy processes of translation, scaling, and rotation of data before it is output. Zero-fill scans will be output directly instead of processing the data. This bypass capability is for the registration phase when the EU input data is being registered and the output products (i.e., registration IR tape; isothermal display and tape, registered disk file) are being created. The following are operation procedures for the zero-fill bypass.

A. The operations personnel will use the isothermal display as a means of detecting the end of data and the beginning of zero-fill in the image. This does not apply to those areas where data dropout have occurred within the data image.

B. Position the VT05 cursor to the command line, key in 'END' <CR> when zero-fill is visually detected.

C. After having acknowledged the END command, the software discontinues reading in of the input tape.

D. The system will loop continuously outputting zero-fill scans to the registered disk and output products until the remaining total scans needed are output.

E. If running a normal day pass, the system will then cycle back to read in and process the VIS channel data. Data is processed up to the scan line at which processing was halted or bypassed on the IR pass. Zero-fill VIS scans are then written out to disk repeatedly until the remainder of a total of 550 scans are output.

NOTE: This feature is not applicable during a day restart pass (after IR registration) as there is no isothermal display and no visual means of detecting the beginning of zero-fill in the image.

SECTION 6

DATA BASE UPDATE PROCEDURES

6.1 RAINFALL ALGORITHM PROGRAM (RAP) OR DATA BASE UPDATE SEQUENCE NO. 1

6.1.1 Program Description. The RAP Program will perform daily rainfall estimation calculations, daily mean air temperatures calculations, build a data base update tape (delete tape), build a rainfall tape (ORC), and output to the line printer pertinent information pertaining to the Mexican Meteorological Stations. The input sources for this data base update are a registered disk containing three channels of data; day visible data, day radiometric (IR) data, and night radiometric (IR) data; a Crop Moisture Index (CMI) tape of Mexico; and on normal data base update runs, an old data base (delete) tape.

6.1.2 Operating Procedures. The data base length is initialized (first time only) to 0 days by the following procedure:

- SEDS production disk (SEDSPR) mounted as DK0
- Enter following command string via the Decwriter

```
$LO 300,300 <CR>
$RU PIP <CR>
#DBINFO.TB/C0<DBINFO.TBL[210,10]<CR>
#C (Control/Shift C)
$FI
```

- Bring SEDS production system up with batch input card deck (paragraph 2.2)
- Enter the program call letter RAP via the VT05 command line.
- Continue with step 2 of this paragraph.

The following are normal operating procedures.

A. Bring SEDS production system up with batch input card deck (paragraph 2.2) Enter the program call letters RAP via the VT05 command line.

B. The first message output to the VT05 immediately after calling up RAP-Sequence 1 processing module is:

"ANY MET DATA CARDS TO READ IN?"

Respond with a YES or NO. Then the following message is output requiring a YES or NO response.

"REGISTERED DISK AVAILABLE?"

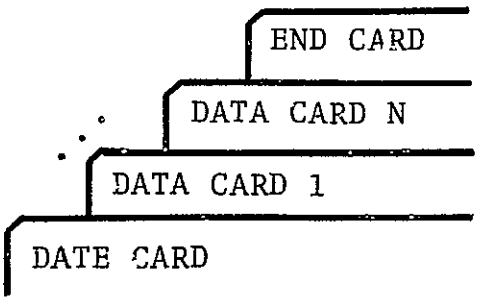
If YES, the date of data is read off the registered disk to use on day output products and date validity check of the MET card deck, if available.

1. If there are no MET cards to read in, RAP proceeds to step C.

2. The MET data cards are read in and processed until the termination (END) card is detected. There are tabs output to the line printer containing:

   - Each input card image including, when necessary, error tagging of invalid inputs.
   - Tabulation of DMAT and precipitation data in sequential order by ID's
   - Summary specifying key MET stations having no input data card this run.

   Refer to figures 6-1, 6-2 for examples of the MET card tabouts. The Met station card deck must be in the following sequence:



MET STATION DATA INPUT CARDS

11 19 75

CARD	ID	DMAT	CODE	PRECIP.	CODE	
1	1	18.00	C	0.00		
2	2	8.00	C	0.00		
3	3	22.00	C	0.00		
4	7	21.00	C	0.00		
5	9	11.00	C	0.00		
* 6	9	49.00	F	0.00	ERROR **-STATION REPORTING MORE THAN ONCE-PRIOR INPUTS IGNORED	
7	10	22.00	C	0.00		
8	11	14.00	C	0.00		
9	12	20.00	C	0.00		
10	14	21.00	C	0.00		
11	15	20.00	C	0.00		
12	17	15.00	C	0.00		
13	18	18.00	C	0.00		
*14	19	0.00		0.00	ERROR **-INPUT CARD DISREGARDED-BOTH DMAT & PRECIP FIELDS BLANK	
15	20	23.00	C	0.00		
16	23	16.00	C	0.00		
17	25	13.00	C	0.00		
18	26	24.00	C	0.00		
19	30	16.00	C	0.00		
20	31	20.00	C	0.00		
21	32	25.00	C	0.00		
22	33	12.00	C	0.00		
23	70	52.00	F	0.00		
24	71	46.00	F	0.00		
25	74	42.00	F	0.00		
26	75	42.00	F	0.00		
27	76	54.00	F	0.00		
28	77	58.00	F	0.00		
29	78	63.00	F	0.00		
30	79	65.00	F	0.00		
31	83	42.00	F	0.00		
32	84	41.00	F	0.00		
33	85	40.00	F	0.00		
34	93	50.00	F	0.00		
35	94	50.00	F	0.00		
36	95	49.00	F	0.00		
37	96	63.00	F	0.00		
38	97	57.00	F	0.00		
*39	98	0.00		0.00	ERROR **-INPUT CARD DISREGARDED-BOTH DMAT & PRECIP FIELDS BLANK	
40	98	49.00	F	0.00		
41	99	57.00	F	0.00		
*42	112	42.00	F	0.00	ERROR **-STATION ID NO. OUT OF 0-99 RANGE	

Figure 6-1 MET Station Data Input Cards

★ MET STATION DATA VALUES AS REPORTED ★

DATE OF DATA: 11 19 75

STATION ID REPORTING	DMAT (K)	TOTAL PRECIP. (MM)
1	291.16	999.99
2	281.16	999.99
3	295.16	999.99
7	294.16	999.99
9	282.60	999.99
10	295.16	999.99
11	287.16	999.99
12	293.16	999.99
14	294.16	999.99
15	293.16	999.99
17	288.16	999.99
18	291.16	999.99
20	296.16	999.99
23	289.16	999.99
25	286.16	999.99
26	297.16	999.99
30	289.16	999.99
31	293.16	999.99
32	298.16	999.99
33	285.16	999.99
70	284.27	999.99
71	280.94	999.99
74	278.72	999.99
75	278.72	999.99
76	285.38	999.99
77	287.60	999.99
78	290.38	999.99
79	291.49	999.99
83	278.72	999.99
84	278.16	999.99
85	277.60	999.99
93	283.16	999.99
94	283.16	999.99
95	282.60	999.99
96	290.38	999.99
97	287.05	999.99
98	282.60	999.99
99	287.05	999.99

****

MET STATIONS NOT REPORTING TODAY

ID: 19 72 73 0 0 0

Figure 6-2 MET Station Data Values

- Date Card. Columns 1 - 8 will contain the date of the MET data in the format of:

  MM-DD-YY or MM DD YY

  Input does not have to be right or left justified. Example:

  1 2 3 4 5 6 7 8

  4 - 2 5 - 7 5

- Data Cards 1 Thru N

COLUMN	DESCRIPTION
3 - 5	Met station ID (must be right justified). Do not have to input leading zeroes.
10 - 19	Daily Mean Air Temperature (DMAT). Can be input in 2 formats; integer (input must be right justified; leading zeros or decimal point not necessary) and Floating Point (input can be anywhere in the allotted field. Must contain a decimal point.
20	Alpha code. C for centigrade input of DMAT; F for fahrenheit input of DMAT; and Ø (blank) for defaults to centigrade.
25 - 34	Total 24 hour precipitation. Can be input in 2 formats; integer (input must be right justified; leading zeros or decimal point not necessary) and Floating Point - (input can be anywhere in the allotted field. Must contain a decimal point).

COLUMN	DESCRIPTION
35 - 36	Alpha code. IN for inches input of precipitation; MM for millimeters input of precipitation; and Ø (blank) for defaults to millimeters.

The DMAT or precipitation field on a card can be left blank if the input is not available.

- End Card. Column 1 will contain the character E to indicate the end of the data cards in the card deck.

The messages below are output to the VT05 upon completion of processing the MET card deck:

"MET STATION CARD INPUTS COMPLETED-CHECK TABOUT"
GO to proceed into sequence 1 if correct
CON to re-process corrected card inputs
RST to restart entire job.

The operator checks the line printer tabouts (figures 6-1 and 6-2). Any invalid inputs are flagged on the tabout (figure 6-1). If there are any errors, the operator corrects the card deck at this time and then enters CON which results in reading the MET card deck in again. RST results in the message "ANY MET DATA CARDS TO READ IN" to be output to the VT05 to enable the operator to restart the job specifying there will be no MET cards for this run. A GO proceeds to paragraph C.

3. Should the date on the first MET card (date card) not be the same as that of the data disk file, the messages below are output to the VT05. This date check is performed to ensure that the correct MET data cards are being input for a run.

```
*INPUT DATE NOT SAME AS DATE OF REG. DATA

CHANGE BELOW TO CORRECT DATE IF NECESSARY
    ENTER 'CON' TO PROCEED
    ENTER 'RST' TO RESTART PROGRAM

DATE OF REG. DATA (MM-DD-YY): 11-19-75
```

The date displayed on the VT05 reflects the date read off the registered data disk file and this date is used on all output products. If the date, as displayed, is incorrect or garbled, the operator can use the ALT key to position to the VT05 date field and enter a new date. The new date input will be passed on for the output products.

Now, if the operator keys in CON on the command line, the program disregards any date discrepancy or further checks, and continues to read in the MET data cards until reaching a terminator. Whatever date is presently displayed on the VT05 is the one that will be used on the output products of SEDS. The operator also has the option to change the date on the date MET card and reinitialize reading of the card deck by keying in RST on the command line. The program recycles, reads in the new date card and performs the same check against the registered disk file date. If the date check is passed this time, the remaining data cards are processed until a terminator is detected.

C. The following message appears on the VT05 command line: "MET UPDATE DISPLAY REQUIRED?"

1. If YES response, the MET update display (figure 6-3) containing the locations of the Mexican Meteorological Station by scan line number/pixel number will be called up. Each MET station is logged with an ID number. The ID number will be used to replace, add, or delete a MET station retained in the METLOC.TBL file on the SEDSPR production disk. The following is the format used to replace, delete, or add a MET station location.

   AAA BB-CCCC,DDDD*

   - AAA = REP. Replace ID number BB with scan line number CCCC, and pixel number DDDD
   - AAA = ADD. Add ID number BB with scan line number CCCC, and pixel number DDDD. It can only be used if there is not already a MET location for the ID to be entered. Use ADD only when there is not an entry for the ID to be entered
   - AAA = DEL. Delete ID number BB from METLOC.TBL
   - BB. Meteorological Station identification number
   - CCCC. Scan line number of MET station ___
   - DDDD. Pixel number of MET station
   - *. Delimiter. When ID number is ready to be entered, position CURSOR under the * using the ALT key and enter an additional * at this position. The messages will indicate the validity of the entry mode.

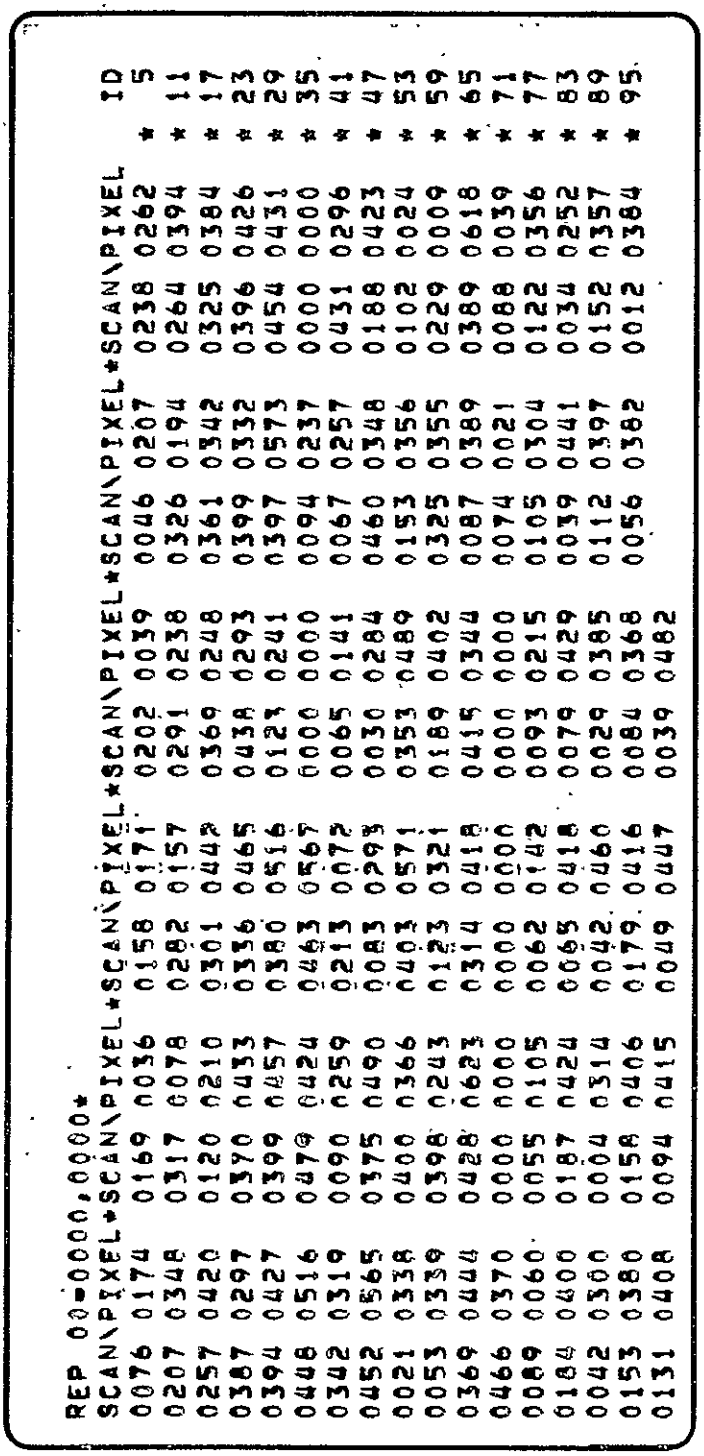
     "-IE- INPUT ACCEPTED".

     "-ID- INPUT ERROR".

     "-ID- NO. INVALID"

   When all entries have been made, enter GO to proceed to the next display. A hardcopy of the MET station will be output to the line printer.

2. A NO response will bypass the MET update display.



```
REP 00=0000.0000*
SCAN\PIXEL*SCAN\PIXEL*SCAN\PIXEL*SCAN\PIXEL*SCAN\PIXEL*SCAN\PIXEL   ID
0076 0174  0169 0036  0158 0171  0202 0039  0046 0207  0238 0262   * 5
0207 0348  0317 0078  0282 0157  0291 0238  0326 0194  0264 0394   * 11
0257 0420  0120 0210  0301 0442  0369 0248  0361 0342  0325 0384   * 17
0387 0297  0370 0433  0356 0465  0438 0293  0399 0332  0396 0426   * 23
0394 0427  0399 0457  0380 0516  0123 0241  0397 0573  0454 0431   * 29
0448 0516  0479 0424  0463 0567  0000 0000  0094 0237  0000 0000   * 35
0342 0319  0090 0259  0213 0072  0065 0141  0067 0257  0431 0296   * 41
0452 0565  0375 0490  0083 0293  0030 0284  0460 0348  0188 0423   * 47
0021 0338  0400 0366  0403 0571  0353 0489  0153 0356  0102 0024   * 53
0053 0339  0398 0243  0123 0321  0189 0402  0325 0355  0229 0009   * 59
0369 0444  0428 0623  0314 0418  0415 0344  0087 0389  0389 0618   * 65
0466 0370  0000 0000  0000 0000  0000 0000  0074 0021  0088 0039   * 71
0089 0060  0055 0105  0062 0142  0093 0215  0105 0304  0122 0356   * 77
0184 0400  0187 0424  0065 0418  0079 0429  0039 0441  0034 0252   * 83
0042 0300  0004 0314  0042 0460  0029 0385  0112 0397  0152 0357   * 89
0153 0380  0158 0406  0179 0416  0084 0368  0056 0382  0012 0384   * 95
0131 0408  0094 0415  0049 0407  0039 0482
```

Figure 6-3 MET Update Display

D. The next output to the VT05 is the following message requiring a YES or NO response:

"UPDATE DMAT COEFFICIENTS? ENTER 'YES' OR 'NO'"

1. A NO response bypasses the DMAT coefficient display (Proceed to paragraph E)

2. A YES response results in outputting the DMAT coefficients display (figure 6-4) containing the most current DMAT coefficients as saved on disk. The operator can input new coefficients by hitting the ALT key to position to each input field and making the desired entry. After all changes are made, the operator keys in GO on the command line. The DMAT coefficients are written back out to disk including any updated entries made for future RAP runs.

E. The RAP display will be called up next and output to the VT05 screen.

F. Refer to the RAP display (figure 6-5). The operator changeable fields are numbered by position and in the sequence the cursor moves when exercising the ALT key option.

1. Position 1. UPDATE PHASE MODE = U. This is the data base mode. The valid entries at this position are as follows:

   a. I = initialize the data base size from 0 days to X number of days. The changeable field is used concurrently with position 2. When using 1, no old update tape will be required (position 11 defaults to number)

   b. U = update data base mode indicates a data base update pass will be made. The data base size has been built to N number of days (position 2). One of the following three options for updating the data base can be selected.

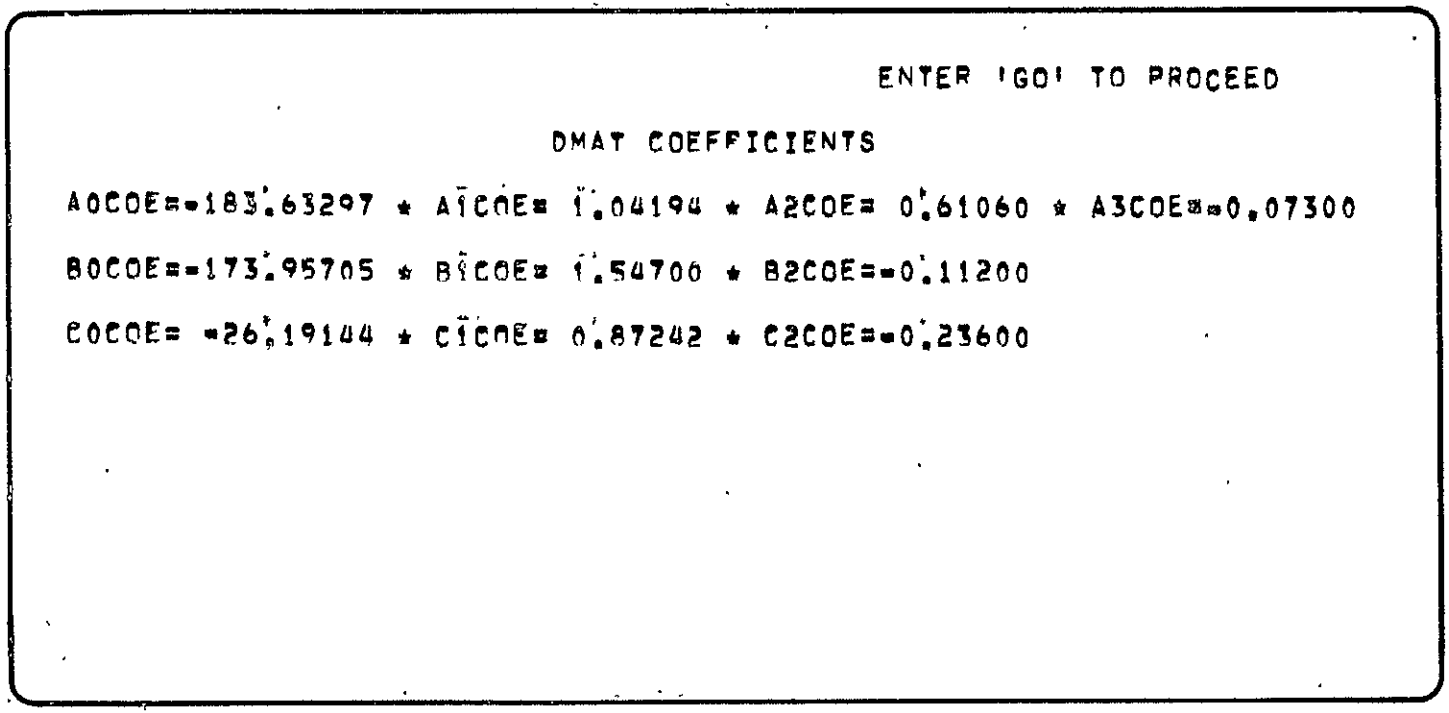


Figure 6-4 DMAT Coefficient Display

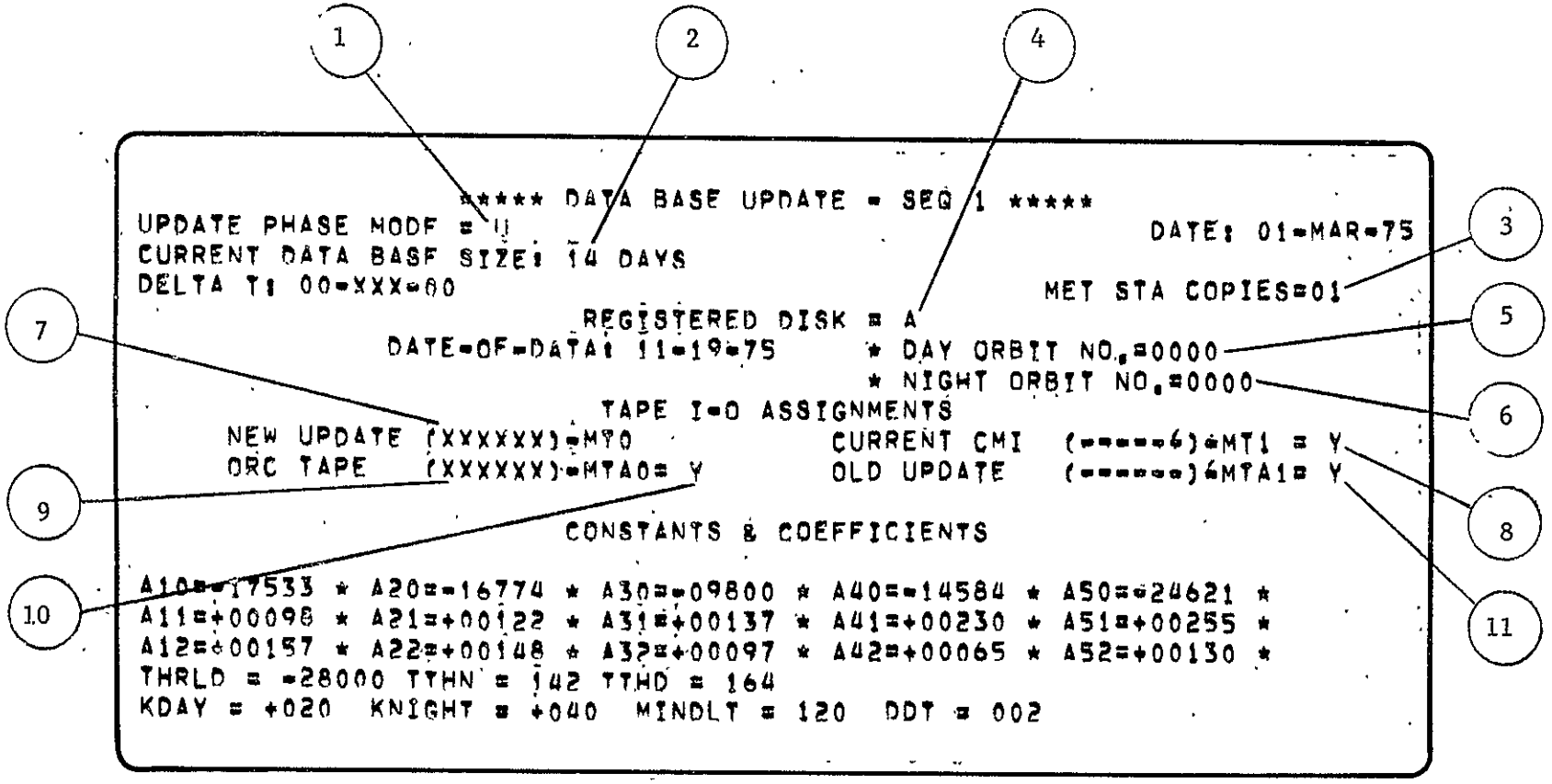


Figure 6-5 RAP Display

- Increase data base size by 1 day. For example, the current data base size is 9 days (position 2). To increase the data base size to 10 days, position CURSOR using the ALT key to position 2 and enter 10. No old data base update is required for this operation (position 11, enter N, for number)

- Normal Data Base Update. In this case the current data base size will remain N number of days. N-1 day is deleted from data base as a new day is added. No entry is necessary at position 2, an old data base update tape for N-1 preceding days. For example, the data base is to be maintained at (14) days. The data base update tape that was made (14) days ago (including today) will be the old data base update tape (position 11, enter Y for yes, old data base update tape available)

- Decrease Data Base size by 1 day. For example, the current data base size is 10 days (position 2). To decrease the data base size to 9 days, position cursor, using the ALT key to position 2 and enter 9. No old data base tape is required for this operation (position 11, enter N, for NO).

c. Z = initialize delta T image file to 128_{10} values. This mode should be run with great care and ONLY when authorized.

d. M = modify data base size allows user to change data base length without regard to 1-day increment limitation of the I and U modes.

2. Position 2. CURRENT DATA BASE SIZE = XX DAYS. The current data base size can only increase or decrease by 1 day. The following groundrule must be understood. After the data base has been initialized to 1 day, decreasing the data base by 1 is not operationally accepted.

3. Position 3. MET STA COPIES = XX. This entry allows the user to change the number of MET station reports to be printed out at the end of the RAP run. Once this entry is made it remains the same until changed.

4. Position 4. REGISTERED DISK = A. The registered disk is the prime source of input to the RAP. The registered disk contains three channels, day visible data, day IR data, and night IR data. The following options are valid for all RAP runs.

   a. A = all data is available, day visible data, day IR data, and night IR data.

   b. D = day data only is available, day visible data and day IR data.

   c. N = night data only is available, night IR data.

   d. X = no registered data available on disk.

5. Position 5. DAY ORBIT NO. = 0000. User should enter orbit number of the day pass when registered disk mode is A or D. This entry is used as identification input to the MET data disk file for a specific day's run.

6. Position 6. NIGHT ORBIT NO. = 0000. User should enter orbit number of the night pass when registered disk mode is A or N. This entry is used as identification input to the MET data disk file for a specific day's run.

7. Position 7. NEW UPDATE (XXXXXX) - MTO. Allows user to enter the tape number of the new data base update tape to be written on MTO.

8. Position 8. CURRENT CMI (------) = Y. The CMI input tape is expected to be mounted on MT1.

   a. Y = yes, CMI tape is available. The program defaults to Y.

b. N = no CMI tape is available for this data base update.

c. (------) denotes the character positions where the CMI tape number will be output to the VT05.

9. Positions 9 & 10. ORC TAPE (XXXXXX) - MTA0 = Y. (XXXXXX) allows the user to enter the tape number assigned to the ORC tape to be output on MTA0.

   Y or N permits the user to specify whether or not an ORC tape is to be output.

10. Position 11. OLD UPDATE (------) - MTA1=Y. The old data base update tape is input on MATA1.

    a. Y = yes, the tape is available. This option should be used only during normal update runs.

    b. N = no old data base update tape is available or required for this run.

    c. (------) denotes the character positions where the old data base update tape number will be output to the VT05.

G. When user has verified and made necessary inputs to the VT05 display. Enter GO <CR> to the program response "ENTER A -GO- COMMAND WHEN READY".

H. The program proceeds to read the header record of the CMI tape.

1. For abnormal CMI tape conditions, one of the following advisory messages appears:

   a. If the following message appears,

      "****ILLEGAL CMI ID FOUND ON MT1"

- Enter CON <CR> to proceed if CMI tape is known to be correct but does not have an ID on it.

- If incorrect tape is mounted on MT1, mount and ready new tape. Enter GO <CR> to proceed.

b. If the following message appears,

"EXPECTED CMI TAPE NBR (XXXXXX), OVERRIDE REQUESTED?"

- Enter YES <CR> , if changing CMI tapes with this day's processing, and this is the correct CMI tape number as displayed on VT05 near the middle of screen.

- If the wrong CMI tape was mounted by mistake and the expected CMI tape number is the one wanted, mount and ready correct tape on MT1. Then answer by entering NO <CR> to question in order to continue without restart.

2. For normal CMI tape input, the program output response will be

"ENTER -CON- TO PROCEED"

Enter CON <CR> to proceed.

I. If Y was entered in position 9 for ORC tape, then the product generation VT05 display (refer to figure 6-6) will come up. The operator will need only to enter any comments and/or select a different image to be monitored via display. Proceed by entering GO <CR>.

1. RAP processing will continue for 550 scan lines, followed by MET station report, printouts (figure 6-7) and rewind of tapes.

2. Enter END <CR> on command line to return control to SEDS resident program.

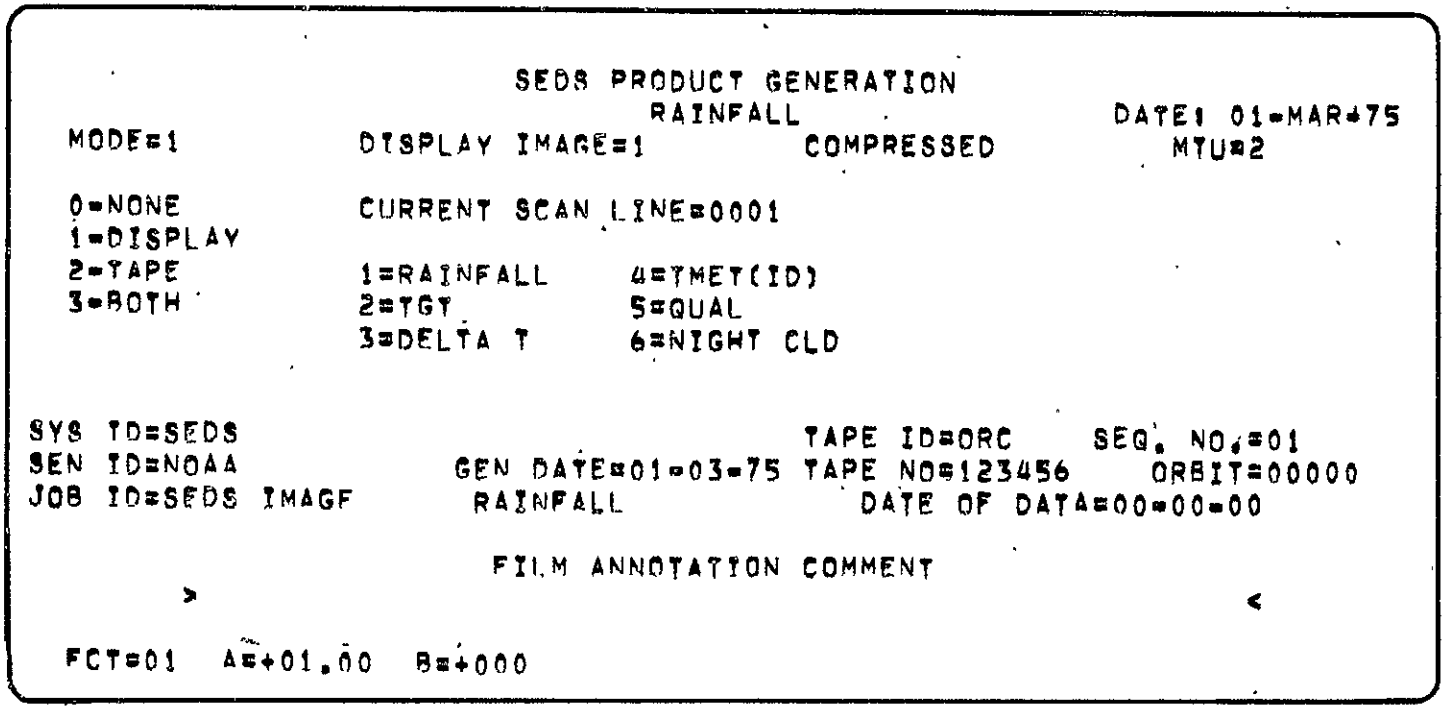


Figure 6-6 Product Generation VT05 Display

DATE OF DATA (MM=DD=YY): 12= 8=75

TD CODE	Y GRID	X GRID	TSD K	DAY VIS	R CODE	TSN K	ALT M	DMAT SRCE	DMAT K	TCARD K	DMAT ERROR C	DELT T K	TGT K	BT TSHLD	CMI CODE
* 85	4	314	293.5	27	C	269.5	525.0	D	285.50	283.25	2.25	1.25	284.25	0	=4.00
* 95	12	384	281.0	66	CD	284.0	125.0	N	284.00	285.50	=1.50	2.00	288.00	0	=4.00
48	21	338	289.0	29	C	272.5	400.0	D	282.00	0.00		2.00	285.75	0	=4.00
87	29	385	288.5	28	C	282.5	175.0	B	280.25	0.00		1.00	287.25	0	=4.00
45	30	284	286.0	31	C	278.5	725.0	B	277.00	0.00		=1.25	282.75	0	=4.00
* 83	34	252	286.0	29	C	280.0	875.0	B	278.25	283.75	=5.50	=0.50	284.00	0	=4.00
82	39	441	282.0	114	H	285.5	50.0	N	285.25	0.00		3.25	287.75	0	=4.00
* 99	39	402	284.5	96	H	273.5	0.0	G	285.75	283.25	2.50	2.50	285.75	N	=4.00
* 84	42	300	289.5	27	C	277.0	575.0	D	282.25	283.25	=1.00	2.50	286.25	N	=4.00
86	42	460	283.0	122	H	287.0	0.0	N	286.50	0.00		5.00	289.75	0	=4.00
4	46	307	288.0	38	CD	282.0	875.0	N	282.25	0.00		0.75	284.75	0	=4.00
* 98	49	447	281.5	100	H	285.5	25.0	N	285.25	284.25	1.00	3.00	287.50	0	=4.00
54	53	339	282.0	33	CD	280.5	450.0	N	281.00	0.00		2.50	286.50	0	=4.00
* 73	55	105	290.0	33	C	283.5	1275.0	B	283.00	283.25	=0.25	0.50	283.75	0	=4.00
* 94	56	382	286.5	62	CD	284.5	150.0	N	284.50	284.25	0.25	2.50	287.00	0	=4.00
* 74	62	142	283.5	39	CD	278.5	1175.0	G	286.25	281.00	5.25	5.25	286.25	N	=4.00
39	65	141	284.5	33	CD	283.5	1150.0	N	283.25	0.00		4.75	286.00	0	=4.00
80	65	418	296.0	47	CD	287.0	50.0	N	286.50	0.00		3.25	287.75	0	=4.00
40	67	257	288.5	29	C	285.0	800.0	B	283.00	0.00		0.75	284.75	0	=4.00
* 70	74	21	290.0	37	CD	287.5	775.0	N	286.75	286.00	0.75	=1.00	284.75	0	=4.00
0	76	174	293.5	29	C	282.0	1375.0	B	283.00	0.00		2.75	283.75	0	=4.00
81	79	429	292.5	34	C	278.0	25.0	D	284.75	0.00		2.25	288.75	N	=4.00
44	83	293	286.5	25	C	287.0	550.0	B	283.75	0.00		0.75	286.50	0	=4.00
* 93	84	368	292.5	31	C	287.5	225.0	B	285.50	0.00		6.75	0.00	0	=4.00
64	87	389	284.5	81	CD	281.0	100.0	N	281.50	0.00		0.25	287.00	0	=4.00
* 71	88	39	289.5	25	C	282.0	1650.0	B	282.00	284.75	=2.75	0.25	285.50	0	=4.00
* 72	89	60	289.5	27	C	286.0	1200.0	B	284.75	282.00	2.75	3.25	285.25	0	=4.00
37	90	259	270.5	39	L	286.5	850.0	N	286.00	0.00		6.75	288.00	0	=4.00
* 75	93	215	301.0	28	C	284.0	1500.0	B	287.00	281.00	6.00	5.75	286.75	0	=4.00
34	94	237	295.5	28	C	279.5	1250.0	B	281.50	0.00		4.00	285.50	0	=4.00
* 97	94	415	293.5	28	C	276.5	0.0	D	285.50	286.00	=0.50	1.75	288.00	N	=4.00
53	102	24	293.5	27	C	285.5	1275.0	B	285.75	0.00		=0.50	285.50	0	=4.00
* 76	105	304	295.0	29	C	285.0	300.0	B	284.50	285.50	=1.00	1.25	287.00	0	=4.00
88	112	397	293.0	24	C	286.5	75.0	B	284.75	0.00		2.50	289.00	0	=4.00
13	120	210	292.5	27	C	278.5	775.0	D	284.50	0.00		6.50	288.00	N	=4.00
* 77	122	356	294.0	27	C	286.0	125.0	B	284.75	286.00	=1.25	0.75	287.00	0	=4.00
27	123	241	294.5	29	C	282.5	1550.0	B	284.00	0.00		7.00	288.50	0	=4.00
56	123	321	280.0	34	CD	285.5	225.0	N	285.25	0.00		2.00	287.75	0	=4.00
* 96	131	408	300.0	27	C	286.0	0.0	B	286.50	287.50	=1.00	0.00	287.50	0	=4.00
89	152	357	298.0	25	C	287.0	125.0	B	286.75	0.00		1.75	288.00	0	=4.00

Figure 6-7 MET Station Report

*	1	169	36	297.0	33	C	0.0	225.0	D	288.25	293.25	-5.00	-2.25	291.25	0	-4.00
	92	179	416	288.5	88	H	289.0	0.0	N	288.25	0.00		0.00	291.25	0	-4.00
*	78	184	400	289.0	87	H	291.5	25.0	N	290.50	289.75	0.75	0.25	290.00	0	-4.00
*	79	187	424	287.5	105	H	291.0	0.0	N	290.00	291.00	-1.00	0.25	291.50	0	-4.00
	47	188	423	287.0	104	H	292.0	0.0	N	290.75	0.00		1.50	292.75	0	-4.00
	57	189	402	289.5	82	CD	290.5	25.0	N	289.50	0.00		0.50	290.25	0	-4.00
*	3	202	39	300.5	31	C	0.0	25.0	D	291.00	294.25	-3.25	-0.50	294.00	0	-4.00
	6	207	348	298.5	30	C	288.0	425.0	B	288.00	0.00		1.50	287.50	0	-4.00
	38	213	72	301.0	25	C	0.0	25.0	D	291.50	0.00		-1.75	292.50	0	-4.00
	39	229	9	300.5	32	C	0.0	-75.0	D	291.00	0.00		-1.00	293.50	0	-4.00
	5	238	262	302.0	46	CD	286.0	1350.0	N	287.00	0.00		4.00	289.50	0	-4.00
*	12	257	420	300.5	30	C	291.5	50.0	B	291.00	292.25	-1.25	0.00	292.50	0	-4.00
*	11	268	394	296.5	29	C	292.0	375.0	B	290.50	287.25	3.25	5.00	292.50	0	-4.00
	8	282	157	302.5	23	C	296.5	75.0	B	295.75	0.00		-0.25	294.75	0	-4.00
*	9	291	238	299.5	29	C	287.0	1850.0	B	289.50	285.25	4.25	4.00	289.25	0	-4.00
*	14	301	442	297.5	30	C	286.0	25.0	D	288.75	293.25	-4.50	0.50	294.50	N	-4.00
	62	314	418	297.5	45	CD	296.0	25.0	N	294.25	0.00		3.25	292.25	0	-4.00
*	7	317	78	301.0	33	C	0.0	50.0	D	291.25	295.25	-4.00	0.50	296.25	0	-4.00
	58	325	355	296.5	31	C	286.5	1900.0	B	288.25	0.00		0.75	290.25	0	-4.00
*	17	325	384	301.0	47	CD	292.0	975.0	N	290.50	289.25	1.25	0.50	289.50	0	-4.00
*	10	326	194	300.0	47	CD	298.5	0.0	N	296.25	295.25	1.00	2.25	297.75	0	-4.00
*	20	336	465	0.0	0	0	287.0	0.0	G	294.25	294.25	0.00	0.00	294.25	N	-4.00
	36	342	319	303.0	33	C	288.5	1875.0	B	291.75	0.00		1.75	291.00	0	-4.00
	51	353	489	0.0	0	0	292.0	-75.0	N	290.75	0.00		1.00	295.75	0	-4.00
	16	361	342	299.5	31	C	288.0	1825.0	B	290.25	0.00		0.00	290.25	0	-4.00
*	15	369	248	303.5	20	C	286.0	925.0	D	293.25	293.25	0.00	0.75	294.00	N	-4.00
	60	369	444	0.0	0	0	282.0	2250.0	N	281.75	0.00		-0.50	283.00	0	-4.00
*	19	370	433	295.0	23	C	282.0	2500.0	B	285.00	283.25	1.75	0.50	283.50	0	-4.00
	43	375	490	0.0	0	0	0.0	1275.0	G	289.25	0.00		-6.00	289.25	0	-4.00
*	26	380	516	0.0	0	0	0.0	0.0	G	295.50	295.25	0.25	0.25	295.50	0	-4.00
*	18	387	297	0.0	0	0	281.5	1600.0	G	289.75	290.25	-0.50	-0.50	289.75	N	-4.00
	65	389	618	0.0	0	0	0.0	0.0	G	294.50	0.00		-0.75	294.50	0	-4.00
	24	394	427	0.0	0	0	222.5	2225.0	G	286.00	0.00		0.75	286.00	0	-4.00
*	23	396	426	0.0	0	0	0.0	2325.0	G	286.75	285.25	1.50	1.50	286.75	0	-4.00
	28	397	573	0.0	0	0	0.0	25.0	G	294.00	0.00		-1.25	294.00	0	-4.00
	55	398	243	0.0	0	0	0.0	350.0	G	296.50	0.00		3.25	296.50	0	-4.00
	22	399	352	0.0	0	0	0.0	1725.0	G	290.75	0.00		0.50	290.75	0	-4.00
*	25	399	457	0.0	0	0	0.0	2150.0	G	285.00	285.25	-0.25	-0.25	285.00	0	-4.00
	49	400	366	0.0	0	0	0.0	1925.0	G	286.25	0.00		3.00	286.25	0	-4.00
	50	403	571	0.0	0	0	0.0	25.0	G	293.50	0.00		-1.75	293.50	0	-4.00
	63	415	344	0.0	0	0	0.0	1300.0	G	289.50	0.00		-0.75	289.50	0	-4.00
	61	428	623	0.0	0	0	0.0	700.0	G	289.75	0.00		7.50	289.75	0	-4.00
	41	431	296	0.0	0	0	0.0	450.0	G	295.00	0.00		-4.25	295.00	0	-4.00
	21	438	293	0.0	0	0	0.0	275.0	G	296.75	0.00		-2.50	296.75	0	-4.00
*	30	448	516	0.0	0	0	0.0	1600.0	G	286.25	288.25	-2.00	-2.00	286.25	0	-4.00
	42	452	565	0.0	0	0	0.0	325.0	G	292.75	0.00		-4.50	292.75	0	-4.00
	29	454	431	0.0	0	0	0.0	1450.0	G	294.50	0.00		-4.75	294.50	0	-4.00
	46	460	348	0.0	0	0	0.0	0.0	G	299.00	0.00		-0.25	299.00	0	-4.00
*	32	463	467	0.0	0	0	0.0	-75.0	G	295.50	297.25	-1.75	-1.75	295.50	0	-4.00
	66	466	370	0.0	0	0	0.0	50.0	G	299.75	0.00		0.50	299.75	0	-4.00
*	31	479	424	0.0	0	0	0.0	-75.0	G	299.75	299.25	0.50	0.50	299.75	0	-4.00

Figure 6-7 (Cont'd)

DMAT ERROR STATISTICS (IN DEGREES C)

CASE	NUMBER	MEAN	STD. DEV.
DAY ONLY	8	-2.000	2.567
NIGHT ONLY	8	0.312	1.016
BOTH	13	0.538	3.142
COMBINED(D,N&B)	29	-0.224	2.718
GT ONLY	10	0.550	2.127
COMBINED(D,N,B&GT)	39	-0.026	2.576

Figure 6-7 (Cont'd)

6.2 SCREWWORM SURVIVAL PROGRAM (SSP OR DATA BASE UPDATE SEQUENCE 2)

6.2.1 Program Description. SSP is used to update and maintain the SEDS data base calculations. Each run uses a new update tape and the previous day's data base tape to produce a new data base tape and screwworm products tape. The screwworm products maps in SSP are optional and may not be calculated and output daily.

A. Mode = $F_1F_2F_3$ (initialized to mode = N3), where F_3 = blank

1. F_1 - Data Base Processing Mode

- A. Add or increase the current data base length N by 1. The add only processing mode is legal if the data base length N is one larger and the new DMAT and new CMI channels are active on the update tape used from RAP.
- D. Delete or decrease the current data base length N by 1. The update tape used serves as a delete tape or some interval days ago. New DMAT and new CMI channels must be active.
- I. Initial or start data base creation. The update tape from RAP must have new DMAT and new CMI channels active as well as have N = 1.
- N. Normal or keep data base length N constant. The update tape from RAP must have all 4 channels active as well as have N equal to the length of old data base.
- Z. Zero or new data missing. Keep data base length constant with null data from update tape.

2. F_2 - Product Generation Code.

- 0. None or bypass screwworm map products (OWC).
- 1. Display only the OWC.
- 2. Output to tape only the OWC.
- 3. Both or output the OWC to tape and to the SEDS display.

3. F_3 - Data Base Length Override. (Data base reinitialization and rebuild)

   - The mode of SSP is normally defaulted to N3. For override of the data base length specified on the update tape, enter M in the 3rd character position, MODE = XXM
   - To reinitialize the data base, set MODE = I3M, and set the new data base length = 01. [UPDATE = (4) (01)]
   - To increase the data base length by 1 for each successive run, set MODE = A3M, and set the new data base length = N + 1, where N is the length of the old data base from previous run
   - Once the data base length is established, and the length is the same as that specified by the update tape, normal processing of MODE = N3 may be continued.
   - To remove the M from the mode entry, blank it out by entering a space character.

B. Screwworm Growth. Constants used in the algorithm to calculate the combined software product (image no. 5 on OWC tape). Coefficients are disk resident and will remain updated.

C. Orbit NBR = 00000. The day pass orbit number specified in the header record of the update tape. This entry is updated automatically when tape is read and cannot be changed until the product generation display is called up.

D. Date of Data = 00-00-00. Specifies the date of the day pass data from the update tape header record. This field is refreshed automatically and is not changeable until the product generation display.

1. 1 = Empirical Function Set. Change from ongoing to Set 2 at scan 551. An option initially conceived as being necessary, but never fully implemented. User should ignore this VT05 information.

2. Update = (X_1) (X_2X_2). Display of channels active (X_1) and data base length $(N) \rightarrow (X_2X_2)$ of update tape mounted on MT0.

3. Old DB = (X_3) (X_4X_4). Display of channels active (X_3) and old date length $(N) \rightarrow (X_4X_4)$ of old data base tape mounted on MTA1.

4. 01 = Long Term Averaging Period. New data base length. Contains the length of the new data base tape to be output to MT1. This value will be updated by program calculation in all cases except in the delete only mode.

5. Tape I-O Assignments. Input tape numbers (update tape and old data base) will be updated via program operation. Output tape numbers (new data base and OWC products) should be entered by operator. The tape unit device entries are fixed and not operator changeable.

6.2.2 Operation Procedures. The following steps initialize SSP.

A. Mount input and output tapes on proper device number and ready with output tape(s) containing write rings.

B. Select program module SSP via the SEDS initial display.

C. The SSP display (figure 6-8) is output to the VT05 screen.

D. Enter correct mode for data base processing and product code.

E. Follow the english instructions sequentially as they are output to line 1 at the VT05.

F. If the product codes 1, 2, and 3 are chosen, the SEDS product generator VT05 display will come up. The operator will need only to enter comments and select a different image to be displayed if desired, then proceed as advised; refer to figure 6-9.

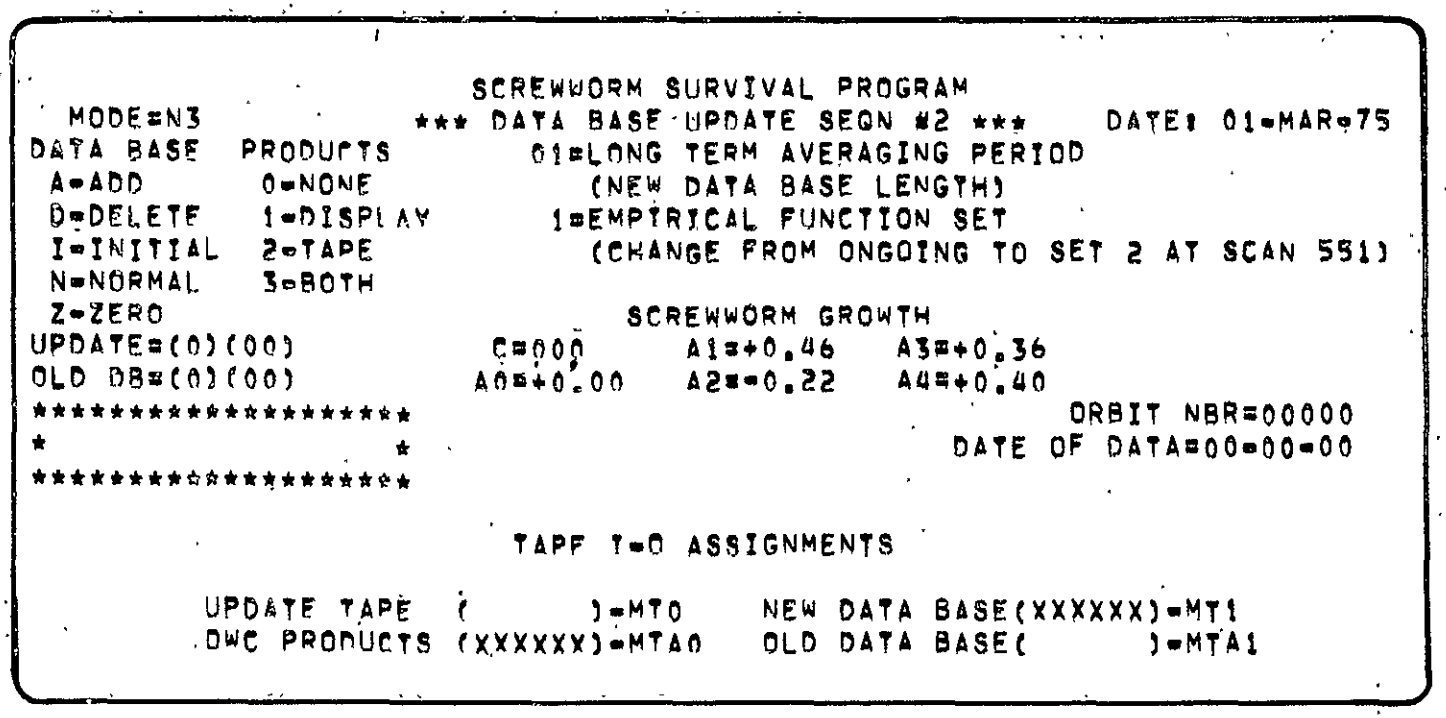


Figure 6-8 SSP Display

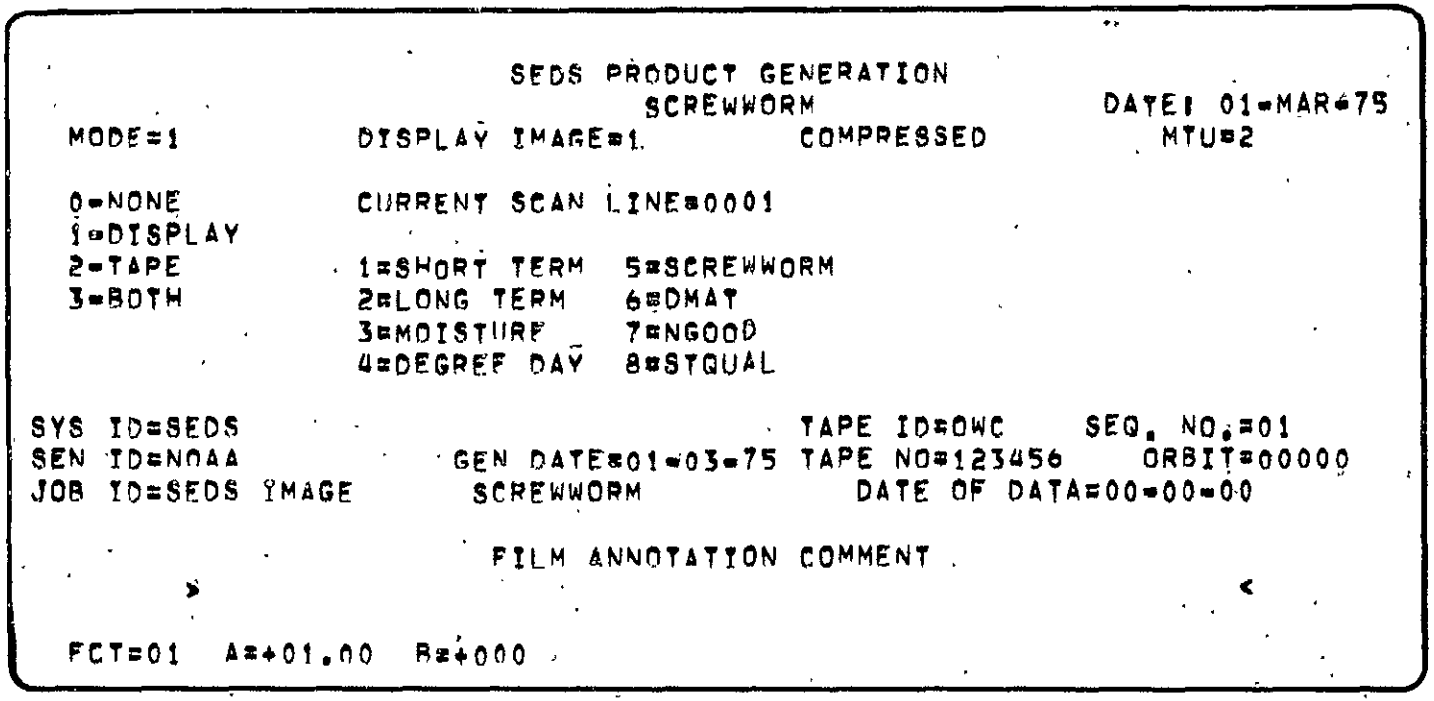


Figure 6-9 SEDS Product Generator VT05 Display

G. Data base processing will continue through scan line number 550. At that time all tapes will rewind and run completion will be output.

H. Enter END on command line to return to SEDS initial display.

Should the message ABORT CONDITION appear, the user should verify that his data base processing mode is the one desired, and he has the correct input tapes mounted. Enter RST for retry.

SECTION 7

DISPLAY AND PRODUCT GENERATOR PROGRAM (DPG)

7.1 PROGRAM DESCRIPTION

This program is used to screen 9-Track universal format tapes from selectable magnetic tape units. In addition, interim production film converter (PFC) color image product tapes may be output to selectable magnetic tape units.

A. Mode = F_1F_2. Indicates mode of operation. These entries may not be changed during data tape processing run.

1. F_1 - Processing Mode

   a. S - Screen only (initialized state). Outputs to the SEDS display video data selected from input tape as defined by channel number (single) start pixel, number of pixels, start scan line, stop scan line, and compression factor.

   b. P - Product Tape Screen. Outputs to the SEDS display video data selected from input tape as defined by 3 channels entered by user.

   c. D - Display Only. Outputs to the SEDS display a 1-channel false color image as determined by selected false color table and A and B coefficients to achieve pick-up of false color data.

   d. B - Both (Display and Tape). Outputs to the SEDS display and to magnetic tape the false color image described above.

   e. T - Tape Only. Outputs to magnetic tape the false color image previously described.

   f. I - Screen PFC Image. The input tape must be one of the following: OID/OID, ORC, or OWC. Requests that the image number from F_2 be screened in the SEDS/PFC false color format of RRGGBBXX.

g. X - Display/Annotation Test. Outputs to the display an internally generated color bar and all possible annotation characters and symbols. Enter GO [CR] to the read header advisory. Test will cycle until END [CR] is entered.

h. E - Tape to-Tape Universal Format Edit. See paragraph 7.3.

i. V - Visible Channel Edit from Registered Disk. See paragraph 7.3.

2. F_2 - Data Type

a. D - Day Pass (Initialized State). The 9-track input tape is determined to have SEDS day pass data. The SEDS display will scroll bottom to top and left to right.

b. N - Night Pass. Tape or selected channel(s) contain SEDS night IR data. The image output to the SEDS display will scroll top to bottom and right to left direction.

c. 1 to 8 - Image Number. Numeric entry (1-8) in this field legal only when F_1=I. Specifies the product required for display from PFC tape. For example: OWC has products 1-8. I5 will display image number 5.

B. MTU = 1 (Initialized State). Selectable tape unit number 0 - 3.

C. Pixel Control

1. STR = 0001. Start pixel number (refreshed when header record is read).

2. NBR - 9999. Number of pixels (refreshed when header record is read).

3. STP = 0000. Last pixel number (not operator changeable and is refreshed when header record is read).

D. Scan Line Control

STR = 00001. Start scan line number.

STP = 00550. Stop scan line number.

CUR = 00000. Current scan line number (updated as input tape is read).

E. Channel Selection. The initialized condition screens channel No. 1 from input tape. Use 3 channels (entered sequentially) only in the product mode (P).

CHAN	
01	Initialized State
00	
00	

F. Scan Line Direction. SLD = N indicates initialized state (normal); SLD = R indicates reversed. Controls the direction of the pixel data within scan lines during D, B, and T processing modes.

G. Compression Factor. Compression factor 1:1 indicates initialized to normal. Controls the compression ratio of both pixels and scan lines in the S (screen only) processing mode. Used to reduce the image size of a scene for the SEDS display.

H. DATA SHF = 2 (Initialized State). Controls the left shift count of each 8-bit pixel output to the SEDS display in the S (screen only) processing mode. Only the 6 most significant bits (MSB's) of each byte are output to the display; the data shift of 2 ensures that the 6 least significant bits (LSB's) of an 8-bit pixel occupy the 6 MSB positions and are output to the display.

I. PRODUCT (Initialized State). CODE = 0. Used for pseudo output product generation for the processing modes (F1) of D, B, or T only.

0 - DAY ISO (OID)	3 - ORC
1 - NIGHT ISO (OIN)	4 - OWC
2 - CMI	5 - SPECIAL

7.2 OPERATION PROCEDURES

The following steps initialize the DPG Program.

A. Mount input tape on magnetic tape unit.

B. If SEDS system is not initialized, use batch card deck as defined in paragraph 2.2 to initialize system.

C. Select program module DPG via the SEDS initial VT05 display.

D. The associated display for DPG will be output to the VT05 screen. Refer to figure 7-1.

E. Make VT05 entries as appropriate for input tape.

F. Enter GO on command line to read header record. The VT05 display will be refreshed with pixel information as well as english identification of tape. Ensure that pixel and scan line is correct before entering 2nd GO command.

G. DPG will begin screening of the input tape.

H. These entries are acceptable on the command line during data tape processing:

- HLT. Suspends program operation after the current scan line has been processed.
- CON. Continues program operation after the HLT has been entered.
- ABT. Aborts the current data run and sets up for next run.
- RST. Should be entered to restart program operation when the end-of-run is determined either by reaching stop scan line number or EOF on tape.

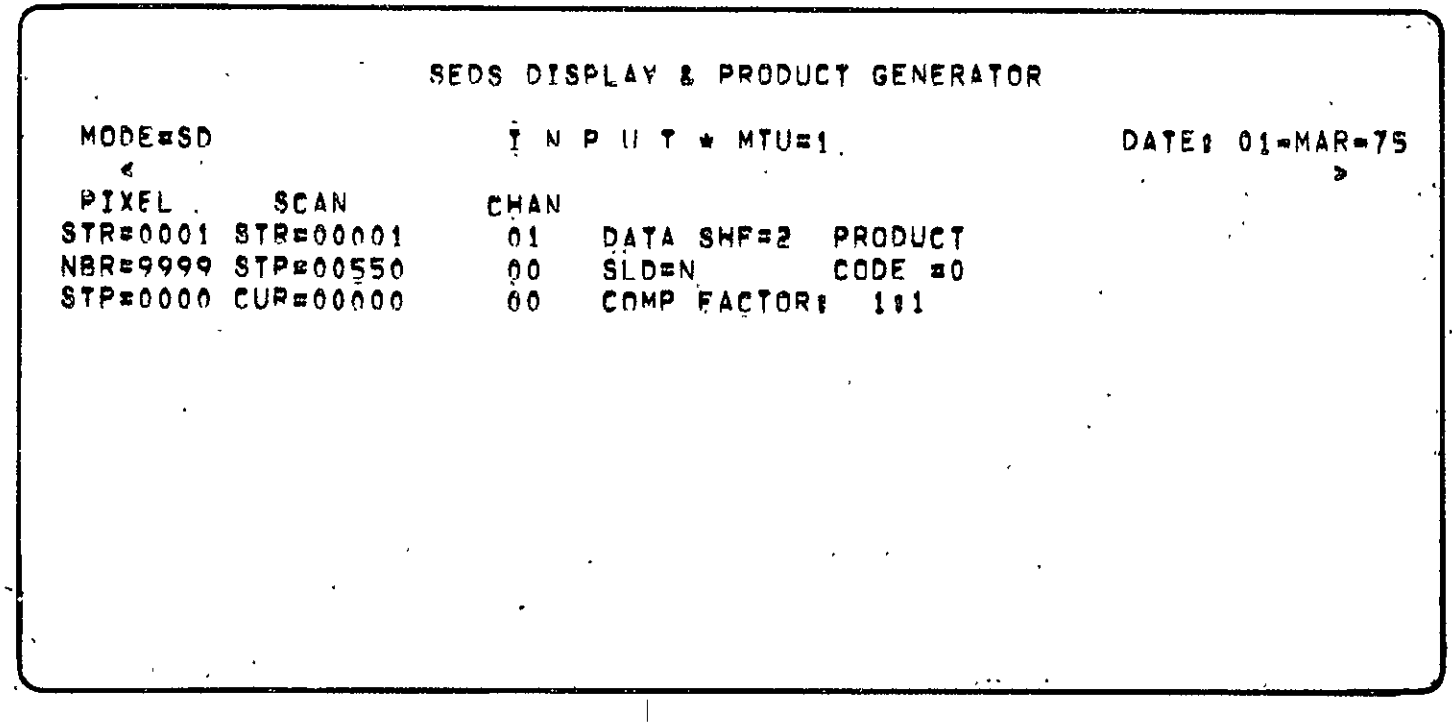


Figure 7-1 Associated Display for DPG

7.3 DPG EDIT FEATURES

Two edit features have been added to the DPG Program; visible channel edit from registered disk, and universal format tape to tape edit.

A. Visible Channel Edit. Visible Channel Edit is used to create a 1-channel universal format tape containing SEDS registered visible data.

- Mount a scratch disk as DK1 and use selected day roll out tape of previously registered disk.
- When roll in of registered disk is completed, mount a tape with write ring on MT1.
- Initialize DPG, as outlined in paragraph 7.2, and set MODE = VD.
- Enter GO to VT05 advisories.
- Initial DPG VT05 display will return when disk-to-tape is completed.

B. Tape to Tape Edit. Universal format tape to tape edit is used for extracting selectable channels (up to 3), pixels, and scan lines. (See figure 7-2.)

- Mount input tape and scratch tape on MT1 and MT2, respectively.
- Set Mode = ED.
- Enter channels, pixels, and scan lines to be edited from input tape.
- Enter GO to VTØ5 advisories.
- When Edit VTØ5 display appears, enter similar information as required.
- Enter GO to proceed.
- The initial DPG VTØ5 display will return, and the program will run until stop scan is reached.

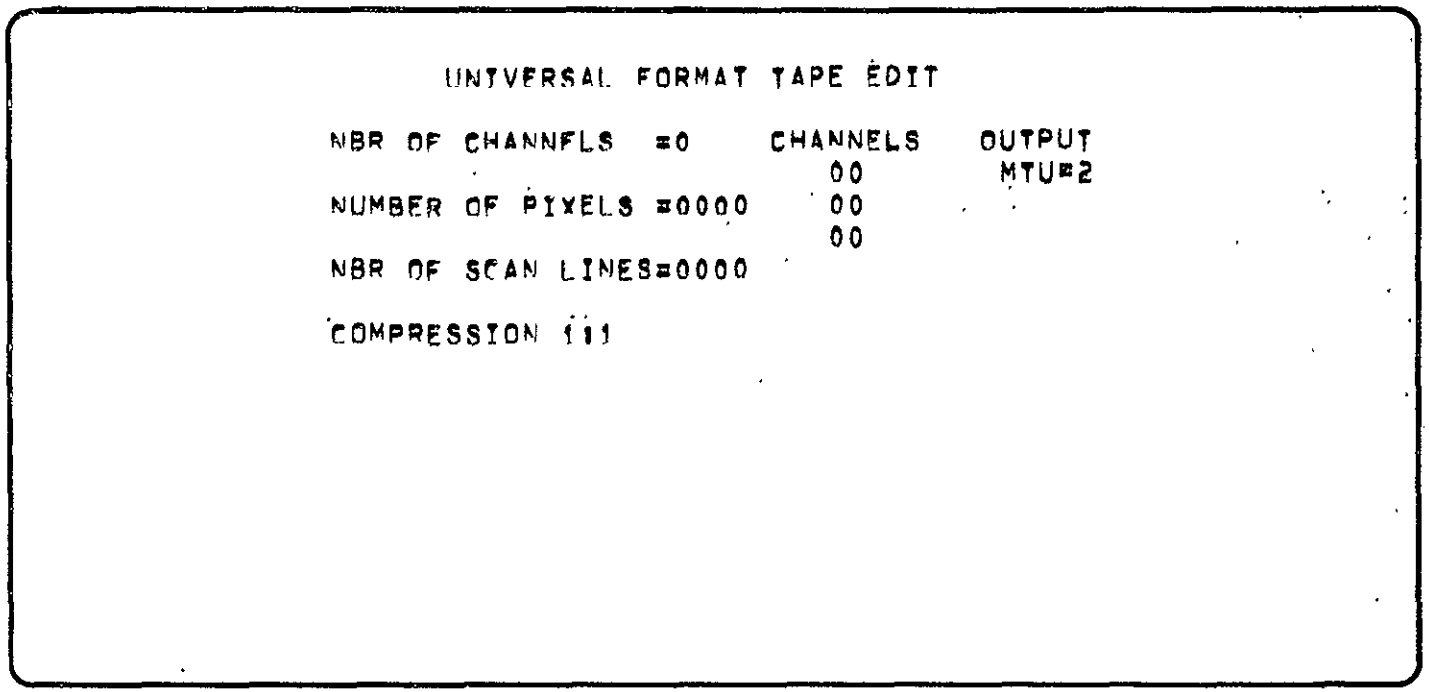


Figure 7-2 Universal Format Tape to Tape Edit

SECTION 8

CHARACTER DENSITY PLOT (CDP) PROGRAM

8.1 PROGRAM DESCRIPTION

The CDP generator outputs temperature coded characters to the line printer. The input source is a 9-track universal formatted tape containing up to approximately 2500 pixels by 2000 scan lines. The temperature coded table is 256_{10} words in length. American Standard Code for Information Interchange (ASCII) codes are assigned to a pixel value range. To generate a new temperature coded table (TEMTB), a new source deck has to be made. The module, TEMTB, has to be reassembled. The CDP module has to be relinked and the CDP memory configuration must be run through FLOAD [100, 100] again on the SEDS production disk. As each pixel value is assigned an ASCII code, it is stored in the line printer output buffer using aspect ratio because of the spacing between the print characters and each line. The scan line pixel is scaled to 250K:1. The number of pixels that are requested per scan line via the VTO5 display, will determine the number of sectors the scan line will be divided into for output. This is determined by dividing the number of characters selected by 85 pixels per sector.

8.2 OPERATING PROCEDURES.

The operating procedures for CDP are:

A. System loaded from SEDSPR disk using batch input card.

B. Input the program call letters CDP.

C. The CDP display is output to the VT05 screen (refer to figure 8-1).

D. Select magnetic tape unit number (default to magnetic tape unit number 1).

E. Enter CON <CR> to read tape header record.

F. The start pixel number, number of pixels per scan line, are updated on the VT05 display.

G. Enter start scan line number, number of scan lines to be processed, start pixel number, and number of pixels to be processed per scan line.

H. Check line printer for ON LINE.

I. Enter GO when ready.

J. When all sectors have been processed, the message "END-OF-JOB: NORMAL COMPLETION" will be output to the line printer.

K. Also the message "ENTER-RST- or -END-" command will appear on the CDP display command line.

L. Enter END to terminate program and return control back to initial display or enter RST to restart the CDP Program again.

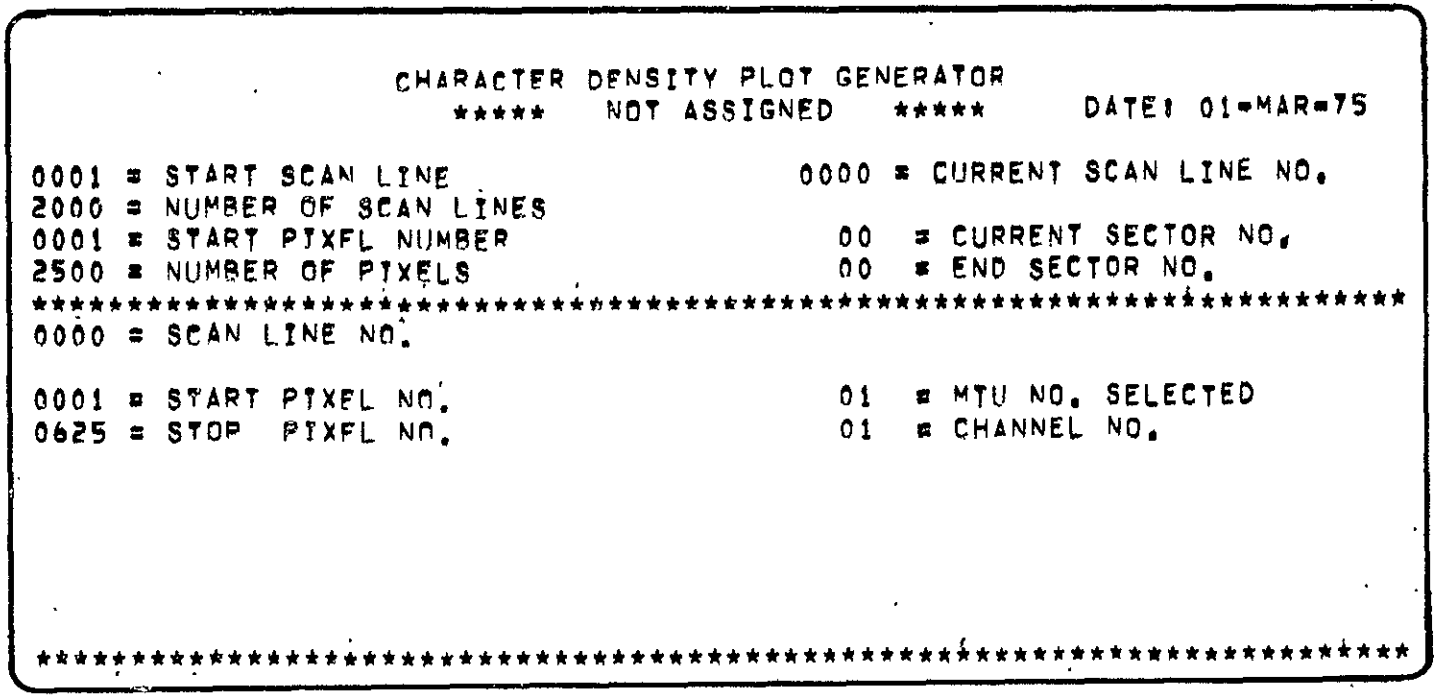


Figure 8-1 CDP Display

SECTION 9

SEDS ADVISORY/ERROR HANDLING PROCEDURES

9.1 ADVISORY/ERROR MESSAGES

The SEDS provides the operator a communication of warnings or of instructional information to aid in the operation of the system as well as informing of error conditions occurring. The messages are output either on the VT05 (top of screen) or on the line printer. Some may appear in both places. Some conditions are recoverable and this section will outline the necessary responses to various advisory or error messages to enable continuation of processing. The messages are divided up to the individual program modules (i.e., SEU, SRE, DPG, CDP, etc.) for ease in locating a message that might appear, see tables 9-1 thru 9-6. The messages are then further divided into two groups:

- Advisory messages
- Error messages.

TABLE 9-1

SEU ADVISORY AND ERROR MESSAGES

ADVISORY MESSAGES	DESCRIPTION AND/OR RESPONSES
"MOUNT INPUT TAPE ON MTO; ENTER 'GO''	GIVES GO-AHEAD TO READ HEADER OFF THE PCM INPUT TAPE
'COMPLETE EU OUTPUT TAPE ID; KEY IN 'GO''	MAKE INPUT TO SEU DISPLAY THEN PROCEEDS TO INITIATE SEU PROCESSING
'CAL DATA OUT OF BOUNDS-IR CHANNEL ZEROED-INPUT SCAN NUMBER NNNN'	
'INVALID IR CHANNEL TAG-CHANNEL ZEROED'	THE IR CHANNEL INDICATOR ON THE PCM TAPE IS BAD, A CHANNEL OF ZERO FILL IS OUTPUT FOR THE SCAN
'INVALID VIS CHANNEL TAG-CHANNEL ZEROED'	THE VIS CHANNEL INDICATOR ON THE PCM TAPE IS BAD, A CHANNEL OF ZERO FILL IS OUTPUT FOR THE SCAN.
'PROCEEDING TO ZERO FILL NNNN SCANS'	INFORMS OPERATOR OF THE NUMBER OF ZERO FILL SCANS OUTPUT. THIS IS DONE FOR TWO REASONS. • TIME DISCONTINUITY - SCAN LINE DROP OUTS IN THE PCM TAPE • THE PCM TAPE DOES NOT CONTAIN 2200 SCANS (DAY) OR 2500 SCANS (NIGHT); ZERO FILL IS INSERTED TO THE END OF THE OUTPUT TAPE TO ASSURE 2200 OR 2500 SCANS OUTPUT.
'NUMBER OF SCAN LINES OUTPUT:_ _ _ _'	MESSAGE REFLECTS EITHER 2200 OR 2500 SCANS TO INDICATE THAT THE MAXIMUM NUMBER OF SCANS WAS OUTPUT TO THE EU PROCESSED TAPE
'COMPLETED EU PROCESSING' OR 'EU PROCESSING STOPPED - EOF OR EOT REACHED'	MESSAGE DISPLAYED AT THE NORMAL COMPLETION OF EU PROCESSING

TABLE 9-1 (CONTINUED)

ERROR MESSAGES	DESCRIPTION AND/OR RESPONSES
'INVALID SENSOR ID DETECTED IN HEADER'	TAPE CONTAINS WRONG SENSOR ID IN HEADER - SHOULD BE NOAA3, NOAA4, ETC. CHECK INPUT TAPE; EU JOB MUST BE RESTARTED
'EOT OR EOF REACHED AFTER READING HEADER-MTX'	THE INPUT TAPE IS BAD; CHECK TAPE; CONTROL IS RETURNED TO THE SEDS INITIAL DISPLAY
'HEADER TAPE OUTPUT ERROR'	A PARITY ERROR OCCURRED ON WRITING THE HEADER TO THE OUTPUT TAPE. PROCESSING IS TERMINATED; CONTROL IS RETURNED TO THE SEDS INITIAL DISPLAY
'TAPE WRITE ERROR'	A PARITY ERROR OCCURRED ON WRITING TO THE OUTPUT TAPE. PROCESSING IS TERMINATED; CONTROL IS RETURNED TO THE SEDS INITIAL DISPLAY
'JOB ABORTED-TAPE READ ERROR ON 1ST DATA SET'	A PARITY ERROR OCCURRED ON READING THE INPUT TAPE HEADER RECORD. PROCESSING IS TERMINATED; CONTROL IS RETURNED TO THE SEDS INITIAL DISPLAY

TABLE 9-2

SRE ADVISORY AND ERROR MESSAGES

ADVISORY MESSAGES	DESCRIPTION AND/OR RESPONSES
'MOUNT EU DAY INPUT TAPE-MT1; 'GO' TO READ HDR' 'MOUNT EU NIGHT INPUT TAPE-MT1; 'GO' TO READ HDR' 'MOUNT ROTATED INPUT TAPE-MT3; 'GO' TO READ HDR'	MESSAGE OUTPUT AT INITIALIZATION OF REGISTRATION TO INFORM OPERATOR OF UNIT TO MOUNT EU INPUT TAPE ON
'NO DATA FOUND IN EPHEMERIS DISK FILE'	DURING GCP PHASE, A CHECK IS MADE TO SEE IF EPHEMERIS DATA IS AVAILABLE FOR THE ORBIT. THIS MESSAGE IS OUTPUT WHEN THERE IS NO EPHEMERIS ON THE DISK FOR THE PARTICULAR ORBIT RUN
'INVALID THUMBWHEEL OPERATOR INTERRUPT'	DURING GCP SCREENING OF THE INPUT IMAGE THE OPERATOR KEYED AN INTERRUPT ON THE ICD THUMBWHEEL THAT WAS INVALID I.E., A [9,9] CONTINUE SCREENING INTERRUPT WHILE SCREENING WAS IN PROGRESS; OR AN ID NUMBER INPUT WHILE SCREENING WAS IN PROGRESS
'EOT OR EOF REACHED -- SCREENING HALTED'	DURING GCP SCREENING THE TAPE RAN TO THE END-OF-TAPE BEFORE A 'HALT SCREENING' REQUEST WAS INITIATED. SCREENING TO THE ICD IS TEMPORARILY HALTED
'NN SCANS LOST DUE TO READ ERROR - JOB CONTINUES'	DURING GCP SCREENING, THIS MESSAGE INDICATES THE NUMBER OF SCANS LOST BECAUSE OF PARITY ERRORS; ZERO FILL SCANS ARE OUTPUT TO THE ICD SCREEN.
'25 OR MORE SCANS LOST -- SCREENING HALTED'	DURING GCP SCREENING, TOO MANY SCAN LINES WERE LOST DUE TO READ PARITY ERRORS; SCREENING IS TEMPORARILY HALTED. THE OPERATOR CAN SELECT A NEW AREA TO SCREEN
'MOUNT DISK ON DK1 FOR REG.; ENTER 'GO'' 'MOUNT SCRATCH DISK ON DK1; ENTER 'GO''	THIS MESSAGE APPEARS AT THE COMPLETION OF THE GCP PHASE. THE REGISTERED BACKGROUND DISK MUST BE LOADED ON DK1 FOR REGISTRATION PURPOSES. THE 'GO'COMMAND SIGNIFIES TO BEGIN PROCESSING

TABLE 9-2 (CONT'D)

ADVISORY MESSAGES	DESCRIPTION AND/OR RESPONSES
'**NEED TO CHANGE REGISTRATION COEFFICIENTS?'	MESSAGE IS OUTPUT UPON COMPLETION OF THE GCP LOCATION PHASE. IF THE OPERATOR CHECKS THE CALCULATED COEFFICIENTS WITH THEIR PREDICTED VALUES AND NEEDS TO MAKE ANY CHANGES; KEY IN'YES'. A DISPLAY CONTAINING THE COEFFICIENT JUST CALCULATED IS THEN OUTPUT TO THE VT05 TO WHICH CHANGES CAN BE ENTERED VIA THE OPERATOR. KEY IN 'NO' IF CHANGES ARE NOT REQUIRED.
'**NEED TO USE REG. COEFFICIENTS FROM DISK?'	MESSAGE IS AUTOMATICALLY OUTPUT IF THE OPERATOR SELECTS TO BYPASS THE GCP SCREENING PHASE. KEY IN 'YES' AND THE COEFFICIENTS STORED ON DISK FOR THE LAST RUN ARE READ IN AND OUTPUT TO THE VT05 FOR VERIFICATION. KEY IN 'NO' AND THE PROGRAM ASSUMES COEFFICIENT CARD INPUTS ARE TO BE READ IN.
'REGISTRATION PROCESSING PHASE BEGUN'	THIS MESSAGE APPEARS IMMEDIATELY PRIOR TO THE ACTUAL PROCESSING OF THE DATA AFTER EITHER THE GCP PHASE IS COMPLETE OR CARD INPUTS READ IN.
'NIGHT COARSE ROTATION PHASE BEGUN' 'COMPLETED NIGHT COARSE ROTATION'	MESSAGES OUTPUT TO INFORM OPERATOR WHEN THE BUILDING OF THE COARSE ROTATED TAPE BEGINS AND IS COMPLETED.
'COMPLETED DAY IR CHANNEL REGISTRATION'	MESSAGE OUTPUT TO INFORM OPERATOR WHEN THE IR CHANNEL OFF THE DAYS INPUT TAPE HAS BEEN REGISTERED, READY TO BEGIN THE DAY VIS CHANNEL.
'COMPLETED REGISTRATION PHASE'	MESSAGE OUTPUT AT THE NORMAL COMPLETION OF REGISTRATION. CONTROL IS RETURNED TO THE SEDS INITIAL DISPLAY.

TABLE 9-2 (CONT'D)

ERROR MESSAGES	DESCRIPTION AND/OR RESPONSES
'DK1 DISK MUST BE ZEROED; JOB ABORTED'	IN NIGHT COARSE ROTATION PHASE, THERE WAS NOT ENOUGH ROOM ALLOCATED ON THE DISK.. OPERATOR MUST ZERO THE DISK AND RESTART JOB.
'HEADER DISK FILE WRITE ERROR; JOB ABORTED'	UNABLE TO WRITE THE HEADER RECORD OR THE REGISTERED DISK FILE JOB MUST BE RESTARTED.
'DATA DISK FILE ERROR; JOB ABORTED'	ON WRITING THE REGISTERED DATA OUT TO DISK, RECEIVED A DISK WRITE ERROR. JOB MUST BE RESTARTED USING PROCESSING OPTION 2 OR 4 (NIGHT/DAY RESTART).
'EOT DETECTED; REGISTRATION TERMINATED'	AN EOT WAS DETECTED ON THE INPUT TAPE PRIOR TO PROCESSING 2200 SCANS (DAY), 2500 SCANS (NIGHT). PROCESSING IS TERMINATED. CONTROL IS RETURNED TO THE SEDS INITIAL DISPLAY. NOTE: THE EU PROGRAM IS SET UP TO OUTPUT 2200 (DAY) OR 2500 (NIGHT) SCANS ON THE EU PROCESSED TAPE. IF THIS MESSAGE SHOULD APPEAR THIS INDICATES A PROBLEM IN EU PROCESSING OR A TAPE PROBLEM. FOLLOW THE PROCEDURES OUTLINED IN PARAGRAPH 9.2 FOR GETTING A CORE DUMP.
'TAPE READ ERROR ON IMAGERY INPUT TAPE'	A PARITY ERROR OCCURRED ON A TAPE READ. PROCESSING CONTINUES; A SCAN OF ZERO FILL IS OUTPUT IN PLACE OF THE INPUT SCAN IN WHICH THE PARITY ERROR OCCURRED.
'INVALID INPUT TAPE-MOUNT CORRECT TAPE, TYPE 'CON' '	ACCORDING TO THE TYPE OF REGISTRATION PROCESSING SELECTED (I.E., DAY, NIGHT, ETC.) THE INPUT TAPE IS NOT CORRECT. THE OPERATOR CAN DO ONE OF THREE THINGS: • KEY IN 'RST' TO GET BACK TO THE REGISTRATION INITIAL DISPLAY. • IF THE WRONG PROCESSING MODE WAS SELECTED, KEY IN THE CORRECT MODE. • KEY IN 'CON' AFTER MOUNTING THE CORRECT INPUT TAPE. • KEY IN 'ABT' TO TERMINATE THE REGISTRATION PHASE.

TABLE 9-2 (CONT'D)

ERROR MESSAGES	DESCRIPTION AND/OR RESPONSES
'JOB ABORTED-TAPE READ ERROR ON HDR'	A PARITY ERROR WAS DETECTED ON READING THE HEADER RECORD OFF THE INPUT TAPE. PROCESSING IS TERMINATED. CONTROL IS RETURNED TO THE SEDS INITIAL DISPLAY.
'TAPE WRITE ERROR-MUX'	A PARITY ERROR OCCURRED ON WRITING OUT TO THE OUTPUT TAPE. PROCESSING IS TERMINATED; THE TAPE IS REWOUND. CONTROL IS RETURNED TO THE SEDS INITIAL DISPLAY.
'DISK READ FAILURE; JOB ABORTED'	AN ERROR OCCURRED WHILE TRYING TO READ THE NIGHT COMPRESSED DATA OF THE DISK (DK1). PROCESSING TERMINATED; CONTROL IS RETURNED TO THE SEDS INITIAL DISPLAY.

TABLE 9-3

RAP ADVISORY AND ERROR MESSAGES

ADVISORY MESSAGES	DESCRIPTION AND/OR RESPONSES
'ENTER A -GO- COMMAND WHEN READY'	PROGRAM IS WAITING TO RECEIVE 'GO' COMMAND TO BEGIN PROCESSING.
'ENTER -RST- OR -END- COMMAND'	PROGRAM IS WAITING TO RECEIVE -RST- TO REINITIALIZE PROCESSING OR -END- TO TERMINATE PROCESSING.
'END-OF-RUN: NORMAL COMPLETION'	RUN HAS SUCCESSFULLY COMPLETED ALL OPERATIONS. CONTROL IS RETURNED TO THE SEDS INITIAL DISPLAY.
'END-OF-RUN: ABNORMAL COMPLETION'	DURING RUN AN ERROR CONDITION WAS ENCOUNTERED AND JOB TERMINATED. OPERATOR CAN DO ONE OF TWO ACTIONS: • KEY IN -RST- TO RESTART PROGRAM • KEY IN -END- TO COMPLETELY TERMINATE PROGRAM AND RETURN CONTROL TO SEDS INITIAL DISPLAY
'ENTER -CON- TO PROCEED	PROGRAM IS WAITING TO RECEIVE 'CON' TO PROCEED WITH PROCESSING.
'ANY MET DATA CARDS TO READ IN?'	MESSAGE OUTPUT AT VERY START OF RAP INITIALIZATION. OPERATOR KEYS IN 'YES' OR 'NO'.
'REGISTERED DISK AVAILABLE?'	THIS MESSAGE IMMEDIATELY FOLLOWS THE ABOVE MESSAGE. A 'YES' RESPONSE RESULTS IN THE SOFTWARE READING THE DISK FILE AND EXTRACTING THE DATE OF DATA FOR THE OUTPUT PRODUCTS AND VALIDITY CHECK ON THE MET DATA CARD DECK.
'MET UPDATE DISPLAY REQUIRED?'	A 'YES' RESPONSE RESULTS IN THE OUTPUT OF A VT05 DISPLAY CONTAINING ALL CURRENT MET ID STATIONS AND COORDINATES. A 'NO' RESPONSE BYPASSES THE MET UPDATE DISPLAY.
'UPDATE DMAT COEFFICIENTS? ENTER 'YES' OR 'NO'	'YES' RESPONSE - THE CURRENT DMAT COEFFICIENTS READ FROM DISK (DK0) ARE OUTPUT TO THE VT05. THE OPERATOR CAN MAKE CHANGES TO THE COEFFICIENTS AT THIS TIME, FOLLOWED BY A 'GO' TO PROCEED. 'NO' RESPONSE - BYPASSES DISPLAY OF THE CURRENT DMAT COEFFICIENTS.

TABLE 9-3 (CONT'D)

ADVISORY MESSAGES	DESCRIPTION AND/OR RESPONSES
'MET STATION CARD INPUTS COMPLETED - CHECK TABOUTS' ' 'GO' TO PROCEED INTO SEQ 1 IF CORRECT' ' 'CON' TO RE-PROCESS CORRECTED CARD INPUTS' ' 'RST' TO RESTART ENTIRE JOB'	A GROUP OF MESSAGES OUTPUT TO THE VT05 AFTER PROCESSING THE MET DATA CARD DECK.
ERROR MESSAGES	**DESCRIPTION AND/OR RESPONSES**
'TAPE ERROR ON HEADER RECORD'	A TAPE READ (PARITY) ERROR WAS DETECTED ON READING THE HEADER RECORD. THE JOB IS TERMINATED. ENTER -RST- TO RESTART RUN.
'HEADER RECORD ERROR'	CHECK INPUT TAPE HEADER RECORD. RUN IS TERMINATED. OPERATOR MAY RESTART JOB BY KEYING IN -RST-
'DATA BASE SIZE ERROR'	AN ATTEMPT WAS MADE TO INCREASE OR DECREASE THE DATA BASE SIZE BY MORE THAN 1 DAY. ORIGINAL DATA BASE SIZE IS REFRESHED ON VT05 DISPLAY. INPUT PROPER VALUE AND ENTER A 'GO' COMMAND TO PROCEED.
'OPERATOR INPUT ERROR'	INVALID UPDATE PHASE MODE SELECTED ON RAP DISPLAY. VALID ENTRIES ARE (I) AND (U). CORRECT INPUT.
'TAPE STATUS CODE ERROR'	UNDEFINED TAPE STATUS CODE DETECTED. RUN IS TERMINATED. ENTER -RST- TO RESTART RUN IF DESIRED.
'TAPE READ DEVICE ERROR'	TAPE READ (PARITY) ERROR OCCURRED DURING READ OPERATION. RUN IS TERMINATED. ENTER -RST- TO RESTART RUN.
'DISK WRITE ERROR'	ERROR DETECTED ON A DISK WRITE OPERATION. ENTER -RST- TO RESTART PROGRAM OR -END- TO TERMINATE RUN AND RETURN TO SEDS INITIAL DISPLAY.

TABLE 9-3 (CONT'D)

ERROR MESSAGES	DESCRIPTION AND/OR RESPONSES
'DISK READ ERROR'	ERROR DETECTED ON A DISK READ OPERATION. ENTER -RST- TO RESTART PROGRAM OR -END- TO TERMINATE RUN AND RETURN TO SEDS INITIAL DISPLAY.
'DUPLICATE -MET- STATION ENTRIES'	DUPLICATE METEOROLOGICAL STATIONS FOUND IN THE METLOC.TBL. CONTROL IS RETURNED TO THE -MET- DISPLAY.
'****ILLEGAL CMI ID FOUND ON MT1'	CMI TAPE HEADER RECORD DOES NOT HAVE A VALID ID TAG. IF CMI TAPE IS KNOWN TO BE CORRECT. ENTER CON <CR> TO PROCEED. IF INCORRECT TAPE IS MOUNTED ON MT1. MOUNT AND READY NEW TAPE, AND ENTER GO <CR> TO PROCEED.
'EXPECTED CMI TAPE NBR (XXXXXX), OVERRIDE REQUESTED?'	ENTER YES <CR> IF CHANGING CMI TAPES WITH THIS DAY'S PROCESSING AND THE TAPE NUMBER DISPLAY ON THE VT05 SCREEN NEAR THE MIDDLE IS CORRECT. IF THE WRONG CMI TAPE WAS MOUNTED, AND THE EXPECTED CMI TAPE NUMBER IS WANTED; THEN MOUNT AND READY CORRECT TAPE, AND ENTER NO <CR> TO PROCEED.
'****ILLEGAL SBC TAPE ID ON MTA 1'	THE OLD UPDATE TAPE BEING INPUT DOES NOT HAVE A VALID ID TAG. ENTER END <CR> OR RST <CR> FOR PROGRAM RESTART TO MOUNT NEW TAPE. ENTER CON <CR> TO PROCEED AS NORMAL.
'****READ PARITY ERROR ON MTA 1'	INFORM USER THAT ABNORMAL TAPE READ CONDITIONS EXIST IN TRYING TO READ OLD DATA BASE UPDATE TAPE. ENTER RST <CR> TO RESTART PROGRAM. ENTER CON <CR> PROCEED AS NORMAL.
'****WRITE PARITY ERROR ON MTO'	ADVISES USER THAT INCORRECT TAPE WRITES ARE BEING PERFORMED ON THE NEW DATA BASE UPDATE TAPE. ENTER RST <CR> TO RESTART PROGRAM. ENTER CON <CR>. PROCEED AS NORMAL.

TABLE 9-4

SSP ADVISORY AND ERROR MESSAGES

ADVISORY MESSAGES	DESCRIPTION AND/OR RESPONSES
'VERIFY MODE ENTRY & ENTRY "GO"'	THIS ADVISORY MESSAGE APPEARS ON LINE 1 AS "SSP" IS INITIALIZED, AND INSTRUCTS THE USER TO CONFIRM THAT "MODE=N3" (DEFAULT CONDITION) IS CORRECT FOR THE DATA BASE TO BE GENERATED. IF THE MODE IS NOT CORRECT, CHANGE TO THE ONE DESIRED BEFORE PROCEEDING. FOR EXAMPLE, IF THE NEW DATA BASE IS TO BE INCREASED BY 1 AND OUTPUT PRODUCTS TO TAPE ONLY, THEN CHANGE THE MODE TO BE A2. WHEN THE MODE ENTRY IS CORRECT, HOME CURSOR, AND ENTER GO <CR> (CARRIAGE RETURN) TO PROCEED. AFTER THE HEADER RECORDS FROM BOTH INPUT TAPES ARE READ AND SELECTED INFORMATION; I.E., TAPE NUMBERS OUTPUT TO VT05 SCREEN. IF THE NAME OF THE MODE AND "OK" APPEARS IN THE RECTANGLE BORDERED BY ASTERISKS, THEN VERIFICATION IS COMPLETE. IF THE NAME OF MODE AND "INVALID" APPEARS, THEN THE FOLLOWING ADVISORY MESSAGE APPEARS ON LINE 1 OF THE VT05 SCREEN.
'ABORT CONDITION - DO NOT PROCEED'	THIS MESSAGE INFORMS USER THAT THE DATA BASE MODE SELECTED COUPLED WITH THE CURRENT INPUT TAPES ARE AN ILLEGAL COMBINATION. USER SHOULD RECHECK BOTH THE MODE AND INPUT TAPES. IF A PROBLEM CAN BE FOUND AND CORRECTED, ENTER RST <CR> TO RESTART.
'ENTER UPDATE TAPE DBLTH & "GO"'	THIS MESSAGE APPEARS WHEN THE "M" MODE IS SELECTED AND INFORMS THE USER TO ENTER THE CURRENT DATA BASE LENGTH MANUALLY IN THE UPDATE = (4) (00) ENTRY.
'ENTER OUTPUT TAPE NBRS & "GO"'	THIS MESSAGE APPEARS IMMEDIATELY AFTER THE VERIFICATION OF ALL MODES EXCEPT THE DELETE MODE AS EXPLAINED ABOVE. USER SHOULD ENTER TAPE NUMBERS OF BOTH THE NEW DATA BASE AND SOFTWARE PRODUCTS TAPES MOUNTED ON MTU 1 AND 3. ENTER GO <CR> TO START PROGRAM EXECUTION AND CREATION OF A NEW SEDS DATA BASE.

TABLE 9-4 (CONT'D)

ADVISORY MESSAGES	DESCRIPTION AND/OR RESPONSES
'DATA BASE UPDATE COMPLETE***'	NORMAL COMPLETION, ENTER END <CR> TO RETURN TO SEDS INITIAL DISPLAY.
ERROR MESSAGES	**DESCRIPTION AND/OR RESPONSES**
'INVALID UPDATE TAPE ID ON MTO'	THIS MESSAGE INFORMS THE USER THAT WHEN THE FIRST RECORD WAS READ FROM DEVICE 0, INCORRECT INFORMATION WAS FOUND. THE USER SHOULD VERIFY THAT THE PROPER TAPE (UPDATE-OUTPUT FROM RAP) WAS MOUNTED AND MADE READY. IF A CORRECTION CAN BE MADE I.E., MOUNTED WRONG TAPE ON MTU 0, USER CAN CONTINUE BY ENTERING CON <CR> AND RST <CR> TO THE ABORT CONDITION MESSAGE.
'INVALID OLD DB TAPE ID ON MT3'	SIMILAR TO THE PREVIOUS MESSAGE EXCEPT THAT IT REFERS TO THE OLD DATA BASE INPUT MOUNTED ON DEVICE 3. RECOVERY IS THE SAME AS EXPLAINED ABOVE.
'DISPLAY TIME-OUT - ENTER "CON"'	INFORMS THE USER THAT AN ABNORMAL CONDITION EXISTS WITH DISPLAY INTERFACE. RECOVERY MAY BE POSSIBLE BY ENTERING CON <CR> TO CONTINUE. IF CONDITION PERSISTS, INSTRUCT OPERATOR TO TAKE CORE DUMP AND RESTART PROGRAM BYPASSING OUTPUT TO THE DISPLAY.
'OWC PRODUCTS TAPE ERROR'	ADVISES USER THAT THE SCREWWORM PRODUCT TAPE CURRENTLY BEING WRITTEN ON MTAO IS IN ERROR. THE CORRECTIVE ACTION SHOULD BE TO ABORT RUN (ABT <CR>) AND CLEAN TAPE UNIT OR TRY NEW TAPE BEFORE PROGRAM RESTART.
'TAPE READ PARITY ERROR ON MTU 0'	INFORMS THE USER THAT ABNORMAL READ CONDITIONS EXIST ON INPUT OF THE UPDATE TAPE MOUNTED ON MTO. CORRECTIVE ACTION SHOULD BE TO ENTER CON <CR> TO PROCEED TO THE 'ABORT CONDITION-DO NOT PROCEED' MESSAGE. ENTER RST <CR> FOR PROGRAM RESTART. SOME TAPE READ PARITY ERRORS CAN BE CORRECTED BY CLEANING TAPE DRIVE HEADS OR COPYING TAPE.

TABLE 9-4 (CONT'D)

ERROR MESSAGES	DESCRIPTION AND/OR RESPONSES
'TAPE WRITE PARITY ERROR ON MTU 1'	ADVISES THE USER THAT INCORRECT TAPE WRITES ARE BEING PERFORMED ON THE NEW DATA BASE TAPE MOUNTED ON MT1. ENTER CON <CR> TO PROCEED TO THE ABORT CONDITION MESSAGE FOR A RESTART. CLEAN TAPE DRIVE HEADS AND/OR USE A NEW BLANK TAPE.
'WRITE RING MISSING ON MT1'	THIS MESSAGE APPEARS WHEN THE WRITE RING IS MISSING FROM THE SCRATCH TAPE FOR THE NEW DATA BASE OUTPUT ON MT1. REMOVE TAPE AND PUT WRITE RING IN TAPE REEL. ENTER CON <CR> TO PROCEED.
'WRITE RING MISSING ON MTAO'	SAME AS PREVIOUS MESSAGE, EXCEPT FOR OWC TAPE ON MTAO.
'TAPE READ PARITY ERROR ON MTU3'	INFORMS THE USER THAT ABNORMAL READ CONDITIONS EXIST ON MTA1 FOR INPUT OF THE OLD DATA BASE TAPE. CORRECTION ACTION SHOULD BE TO ENTER CON <CR> TO GET THE 'ABORT CONDITION - DO NOT PROCEED' MESSAGE. ENTER RST <CR> FOR PROGRAM RESTART. TAPE READ PARITY ERRORS MAY BE CORRECTED BY CLEANING TAPE DRIVE HEADS OR COPYING TAPE.

TABLE 9-5

DPG ADVISORY AND ERROR MESSAGES

ADVISORY MESSAGES	DESCRIPTION AND/OR RESPONSES
'ENTER "GO" TO READ HDR RECORD'	INFORMS THE USER TO ENTER GO <CR> TO READ UNIVERAL FORMAT HEADER RECORD OF INPUT TAPE. IF END <CR> IS ENTERED, THE PROGRAM WILL RECYCLE BACK TO THE INITIAL SEDS VT05 DISPLAY.
'ENTER "GO" TO PROCEED'	INFORMS THE USER THAT THE HEADER RECORD ON INPUT IS VALID AND TO CONTINUE BY ENTERING GO <CR> . IF ABT <CR> IS ENTERED, THE PROGRAM WILL RECYCLE BACK TO THE INITIAL SEDS VT05 DISPLAY.
'ENTER "RST" TO PROCEED	NOTIFIES THE USER THAT THE END-OF-RUN EXISTS DUE TO STOP SCAN, EOF, OR EOT ON INPUT TAPE. ENTER RST <CR> TO RESTART DPG OR END <CR> TO RECYCLE BACK TO THE INITIAL SEDS VT05 DISPLAY.
'REGISTERED DISK EDIT (VISIBLE CHANNEL OUT TO TAPE)'	THIS ADVISORY MESSAGE IS DISPLAYED IN THE CENTER OF VT05 SCREEN WHEN THE PROCESSING MODE OF V IS ENTERED FOR VISIBLE CHANNEL EDIT FROM REGISTERED DISK. USER SHOULD PROCEED BY ENTERING GO <CR> .
ERROR MESSAGE	**DESCRIPTION AND/OR RESPONSES**
'TAPE WRITE ERROR'	ADVISES THE USER THAT INCORRECT TAPE WRITES ARE BEING PERFORMED ON OUTPUT TAPE. TAKE NECESSARY CORRECTIVE ACTION AFTER ENTERING ABT <CR> .

TABLE 9-6

CDP ADVISORY AND ERROR MESSAGES

ADVISORY MESSAGES	DESCRIPTION AND/OR RESPONSES
'ENTER -CON- WHEN READY'	ENTER THE 'CONTINUE' COMMAND ON THE VT05 COMMAND LINE WHEN OPERATIONALLY READY.
'ENTER A -GO- COMMAND WHEN READY'	ENTER THE 'GO' COMMAND ON THE VT05 COMMAND LINE WHEN OPERATIONALLY READY.
'TAPE REWINDING/TAPE NOT READY?'	THIS MESSAGE WILL APPEAR AFTER THE FIRST COMMAND -CON- HAS BEEN INPUT TO READ THE TAPE HEADER RECORD. THE MESSAGE INDICATES ONE OF TWO THINGS: • TAPE ON SELECTED MAGNETIC TAPE UNIT WAS NOT AT 'LOAD POINT' AND TAPE REWIND IS IN PROGRESS • SELECTED MAGNETIC TAPE UNIT IS NOT READY AT PRESENT
'SCAN LINES LOST_ _ _ _TO_ _ _ _'	INDICATES THE NUMBER OF SCANS LOST OFF OF INPUT TAPE: MESSAGE IS OUTPUT ONLY TO LINE PRINTER.
'END-OF-SECTOR'	FOLLOWS LAST SCAN LINE OUTPUT OF SECTOR REQUESTED; MESSAGE IS OUTPUT ONLY TO LINE PRINTER.
'END-OF-JOB: NORMAL COMPLETION'	PROGRAM HAS COMPLETED RUN WITHOUT ENCOUNTERING ANY ERRORS.
'END-OF-JOB: ABNORMAL COMPLETION'	JOB TERMINATED DUE TO IRRECOVERABLE ERROR; CONTROL IS RETURNED TO THE SEDS INITIAL DISPLAY.
ERROR MESSAGES	**DESCRIPTION AND/OR RESPONSES**
'TAPE READ ABORTED - STATUS CODE 13'	TAPE READ ABORTED DUE TO LOSS OF 25 OR MORE CONSECUTIVE SCAN LINES. THIS MESSAGE APPEARS ON THE LINE PRINTER. AS A RESULT, THE MESSAGE 'END-OF-JOB: ABNORMAL COMPLETION' APPEARS ON THE VT05. PROCESSING IS TERMINATED.

TABLE 9-6 (CONT'D)

ERROR MESSAGES	DESCRIPTION AND/OR RESPONSES
'HEADER RECORD ERROR - STATUS CODE 05'	INDICATES TAPE READ (PARITY) ERROR DETECTED ON HEADER RECORD. THIS MESSAGE APPEARS ON THE LINE PRINTER. AS A RESULT, THE MESSAGE 'END-OF-JOB: ABNORMAL COMPLETION' IS OUTPUT TO THE VT05. PROCESSING IS TERMINATED.
'ERROR-INVALID ID ON INPUT TAPE'	THIS MESSAGE IS OUTPUT FOR TWO REASONS. • INDICATES THE SELECTED TAPE FOR PROCESSING IS NOT A UNIVERSAL FORMATTED TAPE, AND PROCESSING SHOULD BE TERMINATED. • THE SELECTED TAPE IS IN UNIVERSAL FORMATTED TAPE AND THE TAPE ID IS NOT A VALID SEDS PRODUCTION TAPE. PROCESSING CAN CONTINUE BY ENTERING A -RST- RESTART COMMAND AND SELECTING THE PROPER SEDS PRODUCTION TAPE OR A -CON- COMMAND WILL PROCESS A UNIVERSAL FORMATTED TAPE USING THE CORRECT NUMBER OF SCAN LINES AND NUMBER OF PIXELS. AN -END- COMMAND AT THIS POINT WILL TERMINATE THE PROGRAM AND RETURN CONTROL TO THE SEDS INITIAL DISPLAY.

9.2 FATAL/HALT CONDITIONS

At times conditions may arise during SEDS production where the machine halts or a fatal error terminates processing. To aid the responsible programmers in tracking down possible software or hardware problems, some procedures to be done in sequence for collecting the type of information required are outlined below. If it appears that the machine is hung up, depress the HALT switch on the console. If a fatal message is printed out on the DECwriter and the system halts, proceed as follows:

A. Write down any pertinent information about the run, the program that was being executed, i.e., CDP, SEU, SRE (night, day, or restart option) etc.

B. Write down any messages that were on the VT05 prior to the fatal/halt.

C. Write down what operator actions were taken prior to the fatal/halt as well as approximately the last thing accomplished in the processing.

D. Supply any DECwriter messages or line printer printouts for the job up to the time it halted.

E. Get the contents of the general registers 0-7 as follows.

- Set console switches to the value 0
- Do this procedure also for registers 1-7, setting the console switches to each value 1 to 7 and repeating the above steps.
- Depress LOAD ADDRESS switch
- Depress REGISTER EXAM switch
- Write down the contents.

F. Get a core dump (SEG dump) as follows.

- Make sure the HALT switch on the console is depressed.
- Set ADDRESS DISPLAY select knobs to CONS PHYS and DATA PATHS.
- Set console switches to 772354; depress LOAD ADDRESS switch. Set console switches to 7400; depress DEPOSIT switch.
- Set console switches to 777572; depress LOAD ADDRESS switch. Set console switches to 1; depress DEPOSIT switch.
- Load register 7 by setting console switches to 7; depress LOAD ADDRESS. Set console switches to 154626 and depress REGISTER DEPOSIT switch.
- Enable HALT switch and depress CONTINUE.
- Core dump should begin immediately.

SECTION 10

VT05 DISPLAY OPERATING PROCEDURES

10.1 DISPLAY DESCRIPTION

The display for the SEDS production system is divided into two parts, the command line and the program control display.

A. Command Line. Line 1 column 1 through column 20. The cursor must be in the HOME position before entering a command or program name. This input must be immediately followed by a carriage return, CR. If the input is valid the command is accepted and the command line is cleared and ready to accept the next input. If a program name is input and is valid, the command is cleared and control is passed to the requested program. The loading time for a program is approximately 10 seconds.

B. Program Control Display. Line 2 column 1 through line 20 column 72. This area is programmable and all changeable fields are predefined by the program. The following list explains the valid input necessary to make the various inputs required to operate the SEDS application programs.

10.2 SEDS VTO5 PROGRAM COMMANDS

Below is a list of the program commands and their description. The descriptions given here are in very general terms. Each SEDS program responds in its own manner to an input command and may not respond at all to some. Therefore, refer to the program sections in this manual as to the use and meaning of each command. Program commands are entered via the SEDS command line (line 1, column 1-40) at the VTO5 display terminal, followed by a carriage return CR character. All commands are 3 characters or less in length.

COMMAND	DESCRIPTION
GO	Begin with the next step in processing; tells module that operator is ready to proceed
ADV	Advance tape command
BCK	Backspace tape command
CON	Continue command. Used when program is suspended temporarily for some reason; e.g., for the correct tape to be remounted
DEB	Debug command. This is keyed in as DEB1, DEB2, of DEB3 to be used by routines as a debug aid. It informs routines to print buffers, flags, etc., to the line printer for investigation of an error or for data information purposes. DEB0 turns the debug command off
END	Indicates completion of or desire to complete a particular phase or sequence in processing
HDC	Hardcopy request command. Automatically dumps to the line printer the current display on the VTO5. This command can be used at any time; it is not program controlled

COMMAND	DESCRIPTION
KIL	Kill program command. Returns control to the DECwriter; all processing is terminated
RST	Restart program command
HLT	Halt program command. Halts program execution or processing temporarily. This is usually followed by the CON command
ABT	Abort program command. Used to terminate processing. Control is usually returned to the SEDS initial page display. This command is not available at all phases, refer to each module section
YES	Yes command
NO	No command

10.3 VTO5 CONTROL CHARACTERS

The following lists the control characters for the VTO5 display.

A. HOME. Returns the cursor to the home position (line 1 column 1).

B. CURSOR UP. Moves CURSOR up one line, same column position.

C. CURSOR DOWN. Moves CURSOR down one line, same column position.

D. CURSOR RIGHT. Moves cursor right one position. If cursor is in column 72 when this key is depressed, cursor will be positioned to next line column 1. If CURSOR is in position on line 20 column 72 when this key is depressed, CURSOR will be positioned to the HOME position.

E. CURSOR LEFT. Moves CURSOR left one position. If CURSOR is in column 1 when this key is depressed, CURSOR will be moved to the preceding line column 72. If CURSOR is in the HOME position when this key is depressed, cursor will be positioned to line 20 column 72.

F. ALTERNATE MODE (ALT). The function of the ALT key is to give the operator the capability to position the CURSOR to changeable fields with one input versus the CURSOR UP, CURSOR DOWN, CURSOR RIGHT, and CURSOR LEFT keys. Using the ALT key will put the user at the first character of a changeable field.

G. HORIZONTAL TAB. Moves the CURSOR by eight positions. Automatic carriage return, line feed is output when cursor reaches end-of-line.

H. LINE FEED. Moves CURSOR to next line.

I. CARRIAGE RETURN. Returns CURSOR to column 1, same line.

J. SPACE BAR. Is not a control character. It is a valid space character recognized by the VTO5 input routine.

SECTION 11

SEDS UTILITY ROUTINES

11.1 UTILITY ROUTINES DESCRIPTION

There are several utility routines written specifically for SEDS processing system. Some are available for the purpose of dumping and interrogating the registered data files on disk and the data base update tapes since these are not in universal format. Other routines are available for creating the necessary ephemeris files to be used in production.

11.2 DLOGIT

The program DLOGIT will delog both update (SBC) and data base (OBC) tapes in an easily readable format on the line printer. The program allows the user to select the data channel desired, start and stop scan number, and start and stop pixel number within a scan line. One data card is required for each data channel, or part of channel to be delogged. Also, the start scan number must be less than or equal to the stop scan number. The same is true for the start and stop pixel numbers.

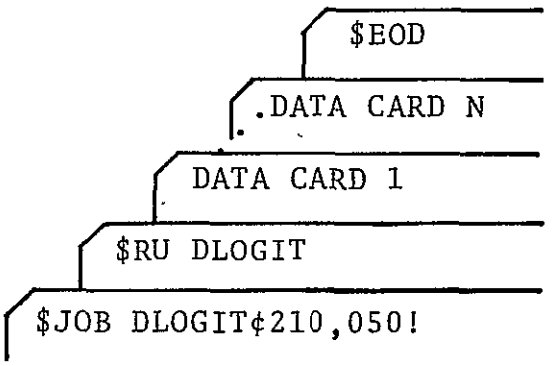
A. Depending on the tape type, punch one of the following number codes in column 5 of the data card to select the desired data channel:

SBC TAPE	OBC TAPE
1 - New CMI	1 - STMAT
2 - New DMAT	2 - LTMAT
3 - Old CMI	3 - LTMCMI
4 - Old DMAT	4 - DDSUM
	5 - NGOOD
	6 - STQUAL

B. To select the start and stop scan numbers, punch the start scan number, right justified, in columns 6-10; and punch the stop scan number, right justified, in columns 11-15 of the data card. A maximum of 550 scan lines may be delogged for each data channel selected.

C. The start and stop pixel numbers are entered in the following manner; punch the start pixel number, right justified, in columns 16-20 of the data card; and the stop pixel number, right justified, in columns 21-25 of the data card. There is a maximum of 625 pixels per scan line.

D. To initiate the job, the following job card deck should be input in the card reader containing the data cards.



E. On the DECwriter, key in BA CR:, LP: <CR> to read the job card deck and begin the tape delog program.

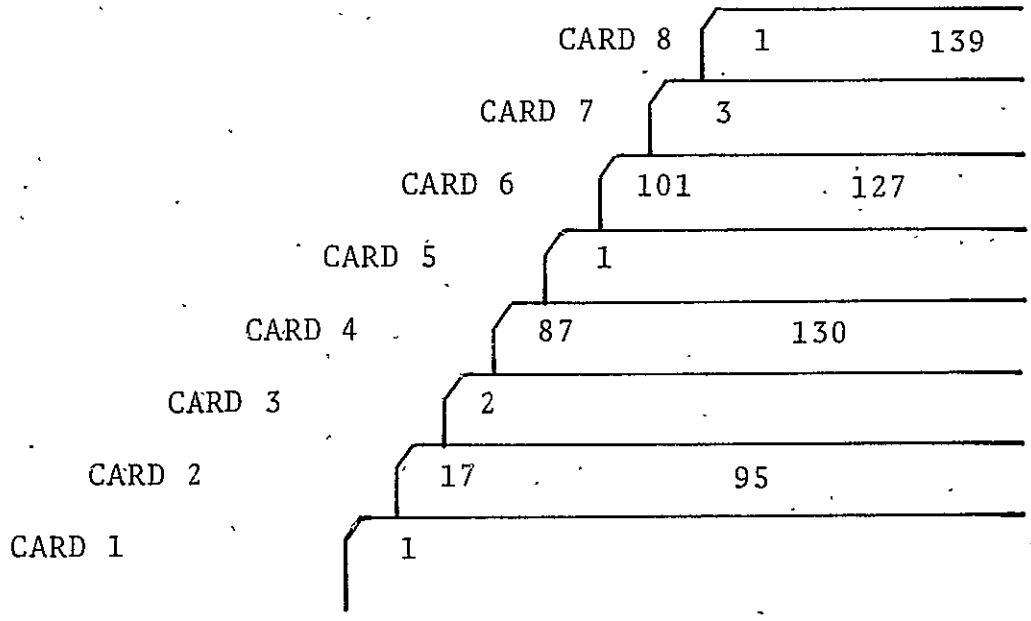
11.3 DUMPIT

The program DUMPIT will dump SEDS registered data from a disk file. The data will be output on the line printer beginning with a dump of the header record. The program allows the user to specifiy the data type and the start and stop record number for each dump desired. Two cards are required for each dump. More than one dump may be done in each run by adding the appropriate data cards.

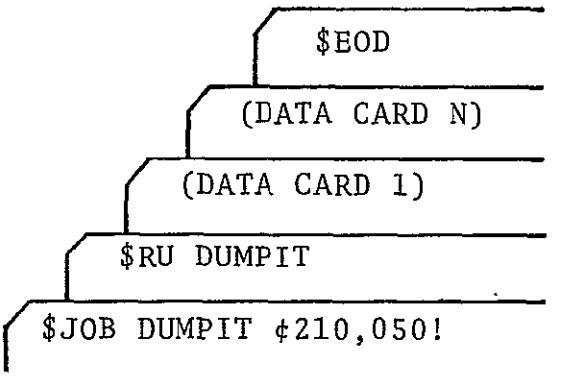
A. To specify the data type, punch one of the following number codes in column 5 of card 1; 1 = night IR data, 2 = day IR data, 3 = day VIS data, 4 = Delta T data, 5 = GTZONE data, and 6 = ALTITUDE data.

B. To specify the records desired for output, a start record number and a stop record number is required. There are 4 output scans to each record; therefore, record 1 contains scan 1-4; record 2 contains scans 5-8, etc. Punch the start record number, right justified, in columns 1-5 of card 2; punch the stop record number, right justified, in columns 6-20 of card 2.

C. A maximum of 130 records may be dumped for each data type. Also, the start record number must be less than or equal to the stop record number. Example: To dump records 17-95 of night IR, records 87-130 of day IR, records 101-127 of night IR, and records 1-139 of day VIS the following data card setup would be required:



D. To initiate the job, the following job card deck should be input in the card reader containing the data cards mentioned below.



E. On the DECwriter, key in BA CR:, LP: <CR> to read the job card deck in and to begin the dump program.

11.4 EPPROC

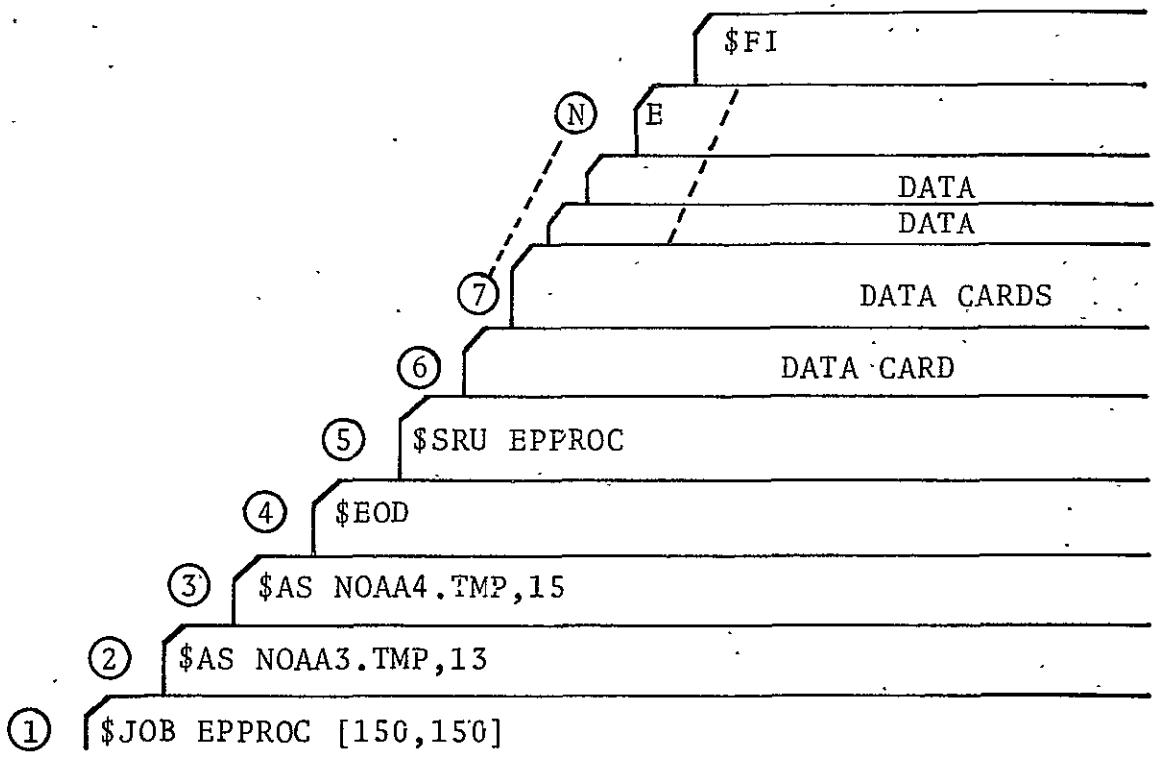
EPPROC is a SEDS batch program that builds the ephemeris disk file used during the registration phase. The program inputs raw data from the card reader, tabs out the card image format, and constructs a temporary disk file. Figure 11-1 illustrates the format of the disk file. Each input card is checked for validity and errors are flagged on the card image printout. Any error encountered on an inputs card will cause the program to abort the job. After all inputs are determined to be valid, the program constructs the disk file and tabs out the computed data.

11.4.1 Operator Inputs

A. Job Initialization. EPPROC is run in batch mode. To execute the program, first place the run deck (described below) in the card reader and make the following entry via the DECwriter:

BAΔCP:,LP:<CR>

B. EPPROC Job Deck. Following is the job deck layout. Table 11-1 describes each field on the cards.



1	Orbit 1
2	JDATE of Crossing
3	Latitude of Crossing
4	Height of Crossing
5	Start Time of Crossing
6	Stop Time of Crossing
7	Start Pixel of Crossing
8	Stop Pixel of Crossing
9	*Night/Day Flag
	Orbit 2
2164	

NOTES:

1. *Night ≠ Zero

2. The table contains a maximum of 4 orbits per day and a maximum of 120 days.

Figure 11-1 Format of Disk File

TABLE 11-1

CARD FIELD DESCRIPTIONS

FIELD DESCRIPTION	CONTENTS	COLUMN
1 JOB CARD	$JOB ΔEPPROC[150, 150]	1-20
2 FILE ASSIGNMENT NOAA3	#AS ΔNOAA3.TMP13	1-16
3 FILE ASSIGNMENT NOAA4	$AS ΔNOAA4.TMP15	1-16
4 END OF DATA CARD	$EOD	1-4
5 RUN CARD	$RU ΔEPPROC	1-10
6 DATE OF RUN CARD	MM/DD/YY/ΔNOAA5	1, 2 - MONTH 3 - 1 4, 5 - DAY 6 - 1 6, 7 - YEAR 10 - BLANK 11-15- NOAA- 16 - SAT ID (3 OR 4)
7 DATA		
NIGHT OR DAY FLAG	N OR D	1
ORBIT	XXXX	10-15
JDAY	XXXX	20-25
HOUR	XX	30-32
MIN	XX.XX	40-45
HEIGHT OR CROSSING	XXXX	50-56
EQL. CROSSING	XXXX.XX	60-70
N END CARD	E	1

11.4.2 Output Messages. Table 11-2 lists the EPPROC error messages.

11.4.3 SEDS Ephemeris Data Tab. Figures 11-2, 11-3, and 11-4 are examples of the SEDS ephemeris tabouts, including the following:

- Figure 11-2, Ephemeris Card Image Printout
- Figure 11-3, Rotation Constants Tabout giving the predicted values for the mapping coefficients per orbit
- Figure 11-4, Ephemeris Disk File Tab.

TABLE 11-2

EPPROC ERROR MESSAGE

MESSAGE	MEANING
UPDATE TERMINATED DATA CARD ERROR	AN ERROR HAS BEEN DETECTED IN A DATA CARD. EXAMINE THE CARD IMAGE LISTING ON THE LINE PRINTER, CORRECT THE ERRORS AND RERUN THE JOB.
UPDATE TERMINATED HEADER CARD ERROR	AN ERROR HAS BEEN DETECTED IN THE HEADER CARD (DATE AN SAT.ID). CORRECT THE ERROR AND RERUN THE JOB.
UPDATE TERMINATED TOO MANY INPUT CARDS	MORE THAN 30 DAYS OF DATA HAS BEEN INPUT. CORRECT THE CARD DECK AND RERUN THE JOB.
END OF UPDATE, VERIFY TAB AND UP-DATE PRODUCTION DISK	NORMAL END OF JOB. THE EPHERMIS FILE IS STORED IN A TEMPORARY FILE ON DKO.

SEDS EPHEMERIS CARD IMAGE PRINTOUT NOAA - 4

DATE OF UPDATE 7/29/75

D/N	ORBIT	JDAY	HOURS	MIN	HEIGHT	LONG	ERROR
N	3424	228	3	7,62	1452,02	96,82	
D	3430	228	15	35,00	1451,90	103,66	
N	3436	229	2	7,64	1451,81	81,82	
N	3437	229	4	2,64	1451,79	110,57	
D	3443	229	16	30,02	1451,69	117,42	
N	3449	230	3	2,67	1451,60	95,58	
D	3455	230	15	30,05	1451,50	102,43	
N	3462	231	3	57,69	1451,40	109,34	
D	3468	231	16	25,08	1451,31	116,19	
N	3474	232	2	57,72	1451,21	94,35	
D	3480	232	15	25,11	1451,12	101,20	
N	3487	233	3	52,75	1451,02	108,11	
D	3493	233	16	20,14	1450,93	114,95	
N	3499	234	2	52,77	1450,85	93,11	
D	3505	234	15	20,16	1450,76	99,96	
N	3512	235	3	47,80	1450,67	106,87	
D	3518	235	16	15,19	1450,58	113,72	
N	3524	236	2	47,82	1450,50	91,88	
D	3530	236	15	15,22	1450,43	98,73	

Figure 11-2 Ephemeris Card Image Printout

SEDS ROTATION CONSTANTS TAB OUT

DATE OF UPDATE 7/29/75

N	ORBIT*	3424*	JDAY*	228*	A2 =	1.019958377	A3 =	-0.043001648	B2 =	-0.001872268	B3 =	0.965416253
D	ORBIT*	3430*	JDAY*	228*	A2 =	0.987477899	A3 =	0.026213357	B2 =	0.043419112	B3 =	0.993208587
N	ORBIT*	3436*	JDAY*	229*	A2 =	1.014782667	A3 =	-0.155417278	B2 =	0.100630902	B3 =	0.954568386
N	ORBIT*	3437*	JDAY*	229*	A2 =	1.015264750	A3 =	0.060563345	B2 =	-0.095842578	B3 =	0.964536250
D	ORBIT*	3443*	JDAY*	229*	A2 =	0.987128079	A3 =	0.122929640	B2 =	-0.050913535	B3 =	0.986014366
N	ORBIT*	3449*	JDAY*	230*	A2 =	1.019937754	A3 =	-0.052335225	B2 =	0.006615377	B3 =	0.964985788
D	ORBIT*	3455*	JDAY*	230*	A2 =	0.987080753	A3 =	0.017542342	B2 =	0.051845066	B3 =	0.993397176
N	ORBIT*	3462*	JDAY*	231*	A2 =	1.016051769	A3 =	0.051309027	B2 =	-0.087458782	B3 =	0.965037286
D	ORBIT*	3468*	JDAY*	231*	A2 =	0.987517595	A3 =	0.114317931	B2 =	-0.042487197	B3 =	0.987036526
N	ORBIT*	3474*	JDAY*	232*	A2 =	1.019844890	A3 =	-0.061589010	B2 =	0.015034111	B3 =	0.964475572
D	ORBIT*	3480*	JDAY*	232*	A2 =	0.986613274	A3 =	0.008870075	B2 =	0.060267348	B3 =	0.993511021
N	ORBIT*	3487*	JDAY*	233*	A2 =	1.016766787	A3 =	0.042050298	B2 =	-0.079068802	B3 =	0.965455353
D	ORBIT*	3493*	JDAY*	233*	A2 =	0.987838984	A3 =	0.105627432	B2 =	-0.033989307	B3 =	0.987991929
N	ORBIT*	3499*	JDAY*	234*	A2 =	1.019677877	A3 =	-0.070912682	B2 =	0.023520201	B3 =	0.963877380

Figure 11-3 Rotation Constants Tabout

SEDS EPHEMERIS DISK FILE TAB NOAA = 4

JDATE	ORBIT	N/D	LONG AND TIME OF CROSSING		HEIGHT	START TIME	STOP TIME	START PIXEL	STOP PIXEL
228	3424,0	N	-96,82	3: 7:38	1452,02	3:12:26	3:18:41	125,0	1924,0
228	3430,0	D	-103,66	15:35: 0	1451,90	15:24:18	15:29:47	1,0	1782,0
229	3436,0	N	-81,82	2: 7:38	1451,81	2:13:22	2:19:38	1873,0	3490,0
229	3437,0	N	-110,57	4: 2:38	1451,79	4: 6:47	4:13: 3	1,0	294,0
229	3443,0	D	-117,42	16:30: 1	1451,69	16:18:50	16:24:19	681,0	3180,0
230	3449,0	N	-95,58	3: 2:40	1451,60	3: 7:32	3:13:47	271,0	2070,0
230	3455,0	D	-102,43	15:30: 3	1451,50	15:19:21	15:24:52	1,0	1655,0
231	3462,0	N	-109,34	3:57:42	1451,40	4: 1:56	4: 8:12	1,0	441,0
231	3468,0	D	-116,19	16:25: 4	1451,31	16:13:56	16:19:25	558,0	3057,0
232	3474,0	N	-94,35	2:57:43	1451,21	3: 2:39	3: 8:56	415,0	2214,0
232	3480,0	D	-101,20	15:25: 5	1451,12	15:14:26	15:19:55	1,0	1529,0
233	3487,0	N	-108,11	3:52:46	1451,02	3:57: 2	4: 3:18	1,0	587,0
233	3493,0	D	-114,95	16:20: 8	1450,93	16: 9: 3	16:14:34	433,0	2932,0
234	3499,0	N	-93,11	2:52:45	1450,85	2:57:45	3: 4: 2	561,0	2360,0
234	3505,0	D	-99,96	15:20:10	1450,76	15: 9:29	15:15: 0	1,0	1400,0
235	3512,0	N	-106,87	3:47:47	1450,67	3:52: 8	3:58:24	1,0	735,0
235	3518,0	D	-113,72	16:15:12	1450,58	16: 4: 9	16: 9:40	309,0	2808,0
236	3524,0	N	-91,88	2:47:49	1450,50	2:52:54	2:59: 9	705,0	2504,0
236	3530,0	D	-98,73	15:15:14	1450,43	15: 4:35	15:10: 6	1,0	1273,0
237	3537,0	N	-105,64	3:42:51	1450,33	3:47:14	3:53:30	1,0	881,0
237	3543,0	D	-112,49	16:10:16	1450,26	15:59:18	16: 4:47	185,0	2684,0
238	3549,0	N	-90,65	2:42:52	1450,18	2:48: 1	2:54:18	849,0	2648,0

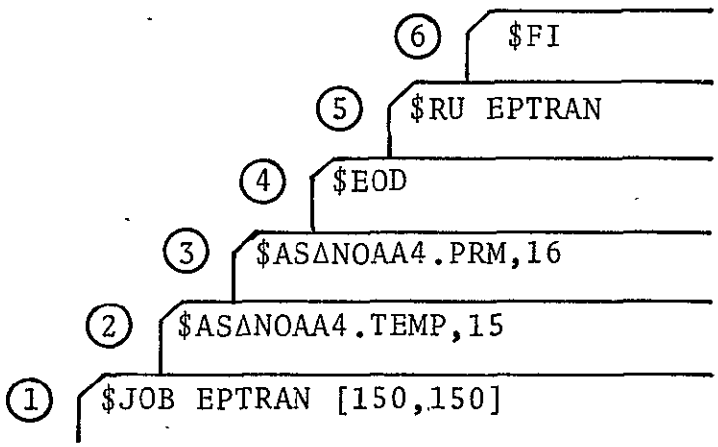
Figure 11-4 Ephemeris Disk File Tab

11.5 EPHEMERIS DATA TRANSFER (EPTRAN)

11.5.1 Program Description. EPTRAN is a SEDS offline program that moves ephemeris data from a temporary file to the operational ephemeris file. The program first reads the new file into core and prints out on the DECwriter the orbits and days contained in the file. The operator is then given the option to continue the transfer or abort the job. If the election is to continue, EPTRAN transfers the old ephemeris file to the temporary file and the new file into the operational file. The operator is then given the option of printing the new file on the line printer or aborting the job.

11.5.2 Operator Inputs. EPTRAN is initialized via the card reader and DECwriter. The run deck is illustrated below. To run the program load the run deck, ready the card reader, and make the following entry via the DECwriter:

BAΔCR:, LP CR



CARD FORMATS

FIELD DESCRIPTION	CONTENTS	COLUMNS
(1) Job card	$JOB EPTRAN [150,150]	1-20
(2) File assignment NOAA 4 temporary	$ASΔNOAA4.TMP,15	1-16

③	File assignment NOAA 4 permanent	$ASΔNOAA4.PRM,16	1-16
④	End of data card	$EOD	1-4
⑤	Run card	$RU EPTRAN	1-10
⑥	Finish card	$FI	1-3

11.5.3 Output Messages. Table 11-3 lists the EPTRAN error/ advisory messages.

TABLE 11-3

DECWRITER MESSAGES

MESSAGE	MEANING	RESPONSE
1. ENTER DATE UPDATE FILE AS MM/DD/YR<CR>	ENTER VIA THE DECWRITER THE DATE ON THE HEADER CARD USED IN EPPROC TO BUILD THE EPHERMIS FILE.	XX,XX,XX
2. TERMINATE JOB * DATE OUT OF LIMITS	DATE OUT OF LIMITS, I.E., MONTH GREATER THAN 12, ETC.	NONE
3. ENTER SATID AS NOAA-X CR	ENTER NOAA 4	NOAA 4
4. JOB TERMINATED SAT.ID NOT 3 OR 4	NOAA 4 MUST BE ENTERED FOR PRESENT SYSTEM.	NONE
5. DATE ENTERED DOES NOT MATCH FILE DATE. DATE OF FILE IS XX/XX/XX. JOB TERMINATED.	DATE ENTERED VIA THE DECWRITER IS DIFFERENT THAN THE FILE DATE ENTERED DURING EPPROC. THE FILE DATE IS GIVEN	NONE
6. UPDATE PARAMETERS DATES IN FILE XXXX TO XXXX. ORBITS IN FILE XXXXXX.X TO XXXXXXX.X. ENTER GO IF CORRECT OR NO IF NOT.	ORBITS AND DATES IN EPHERMIS FILE ARE PRINTED. IF CORRECT THE OPERATOR CAN SELECT TO CONTINUE THE TRANSFER OR IF INCORRECT TERMINATE THE JOB.	GO OR NO
7. JOB TERMINATED AT OPERATOR REQUEST.	NO WAS ENTERED IN RESPONSE TO MESSAGE 7	NONE
8. TAB? ENTER GO IF REQUIRED OR NO IF NOT.	IF A TABOUT OF THE TRANSFERRED FILE IS REQUIRED, THE OPERATOR ENTERS GO AND IF NOT, NO	GO OR NO
9. END OF FILE TRANSFER	NORMAL END OF JOB	NONE

11.6 BACKGROUND IMAGES DISK BUILD ROUTINE (DSKBLD)

11.6.1 DSKBLD Description. DSKBLD is a standalone routine used to build or update the background image disk (DK1) used in SEDS production for registration and RAP processing. The background image disk contains the following files:

- SEDREG.HDR. Registered data header file
- SEDREG.DAT. Registered data disk file (night IR, day IR, day VIS) created by the registration program
- EMSSIV.DAT. Background image (550 scans with 625 pixels each) of emissivity correction values
- SEDGRD.DAT. This file contains two background images (altitude and ground truth) intermixed every fourth scan (each 550 scans with 625 pixels each) used by RAP processing modules.

DSKBLD only allocates space on disk for the SEDREG.HDR and SEDREG.DAT files as they are built by the registration programs. The EMSSIV.DAT and SEDGRD.DAT files are created by DSKBLD, using as input, three 9-track tapes supplied by Lockheed:

- Emissivity tape
- Altitude tape
- Ground Truth tape.

DSKBLD is a relatively flexible program in that the entire background image disk can be built in one pass and it also has the capability of performing updates to a specified file or files on disk (i.e., only a new altitude image to put on the disk is received).

11.6.2 DSKBLD Operating Procedures. Following are the procedures for running DSKBLD:

A. Mount a system disk on DKO.

B. Mount the background image disk (REGBUF) on DK1.

C. Boot the system and enable WRITE PROTECT on DK0.

D. On the DECwriter, log in under UIC 150,150 and call up the DSKBLD load module

```
$ LO 150,150 <CR>
$ RU DSKBLD
```

E. DSKBLD now has control and uses the DECwriter as a communicative device for job setup and operator communication. The following information is output by DSKBLD to the DECwriter awaiting a code entry input by the operator.

SEDS BACKGROUND IMAGE DISK BUILD ROUTINE

Enter Letter Code for type of update, select only one.

- A. Altitude image update
- E. Emissivity image update
- G. Ground truth image update
- B. ALT and ground truth image update
- X. Entire Background Image Disk Update, all of above.

F. If the operator entered letter code A, E, G for single image update the following is printed out to the DECwriter by DSKBLD:

```
MOUNT BACKGROUND IMAGE DISK ON DK1
     MT0 = INPUT IMAGE TAPE
ENTER GO WHEN READY

#__
```

G. If the operator entered code B for a double image update the following is printed to the DECwriter by DSKBLD:

```
MOUNT BACKGROUND IMAGE DISK ON DK1
     MT1 = ALTITUDE IMAGE TAPE
     MT2 = GROUND TRUTH IMAGE TAPE
ENTER GO WHEN READY

#__
```

H. If the operator entered the code X for an entire disk build the following is output to the DECwriter by DSKBLD:

```
MOUNT SCRATCH DISK ON DK1 - ANY DATA ON DISK WILL BE DESTROYED
          MT0 = EMISSIVITY IMAGE TAPE
          MT1 = ALTITUDE IMAGE TAPE
          MT2 = GROUND TRUTH IMAGE TAPE
    ENTER GO WHEN READY
```

I. Enter GO on the DECwriter and DSKBLD proceeds to read the input tape(s) and create the specified image disk files on DK1. When completed, the input tapes are rewound and a message is output to the DECwriter.

11.6.3 Error Messages. Error messages output on the DECwriter from the DSKBLD are as follows, see table 11-3.

A. OPERATOR ABORTED JOB. Operator made an input on the DECwriter other than GO at the point to proceed, indicating desire to terminate the job.

B. INVALID CODE ENTERED - RESTART JOB. Operator keyed in an update letter code other than the valid codes A, E, G, B, X. The program restarts the job with printing out the information as outlined previously.

C. DISK ALLOCATION FAILURE ON UNIT = _____. Message is output when DSKBLD is unable to allocate space on disk for one of the files. The unit number reflects which of the files could not be allocated space. DSKBLD program terminates job.

```
UNIT
 13 = SEDREG.HDR
 14 = SEDREG.DAT
 17 = SEDGRD.DAT
  3 = EMSSIV.DAT
```

D. DISK WRITE ERROR -- JOB TERMINATED -- UNIT = _____. Message is output when an error occurs while writing image data from tape to a disk file. This error is unrecoverable and the DSKBLD program terminates the job. The unit number output with the messages indicates the file in which the error occurred.

E. TAPE ERROR ON UNIT = _____ JOB TERMINATED. Message is output when a read error occurs on reading one of the input tapes. The unit number reflects the tape drive on which the error occurred. DSKBLD terminates the job.

11.6.4 Advisory Messages. Advisory messages output on the DEC-writer from DSKBLD are as follows:

A. Message is output on completion of an entire background image disk build run.

'***JOB COMPLETED***'

B. Message is output on completion of a partial disk update run.

'***SINGLE IMAGE UPDATE COMPLETED***'

11.7 DATA BASE TAPE MERGE PROGRAM (MERGE)

11.7.1 MERGE Description. Current SEDS production requires one new tape each day for data base maintenance. MERGE will put seven tapes onto one tape reel. The data base will remain unchanged except that seven days worth of processing will be cataloged onto a single tape reel.

11.7.2 Operating Procedures. The following are the operating procedures for MERGE.

A. Log in under UIC 210,20.

B. Mount input tapes No's. 1 and 2 onto magnetic tape devices MTO and MT1, respectively.

C. Mount good output tape with write ring on MTAO.

D. Enter $RU MERGE <CR> to initialize program.

E. Program response will be:

PRESS "CONT" TO COPY

Depress the CONT button on the maintenance panel.

F. The program will copy the input tape from MTO onto the output tape on MTAO until the following response is output to the teleprinter:

EOF FOUND ON INPUT TAPE
PRESS "CONT" TO COPY

The tape on MTO will rewind after it has been copied as the first file on MTAO.

NOTE: Switch register bit 0 set to the UP position will assume the input tape to be from MT1. Switch register bit 0 set in the DOWN position reads input tape from MTO.

G. To read input tape No. 2 on MT1, set SWR bit 0 UP and depress CONT. While the tape from MT1 is being copied, remove input tape No. 1 and mount input tape No. 3 on MTO. When input tape No. 2 has finished copying, set SWR bit 0 DOWN and depress CONT for tape copy input from MTO.

H. Continue with toggle of input tapes until seven input tapes have been copied as seven files onto the output tape and the following advisories are output:

```
EOF FOUND ON INPUT TAPE
MAX NBR FILES COPIED ONTO OUTPUT TAPE
MOUNT NEW OUTPUT TAPE
PRESS "CONT" TO COPY
```

If an additional seven input tapes are available for merging; mount another output tape on MTAO and new input tapes, proceed by depressing CONT.

I. The line printer output should be saved as a history of the seven input tapes merged onto each output tape.

11.7.3 Error Messages. If either of the tape parity error messages appear on the teleprinter during the creation of a 7-file MERGE tape, the run should be aborted and action taken to correct the condition. Often input parity errors can be corrected by running MCOPY. Output parity errors sometimes require the changing of tapes.

The error messages are:

- Input parity error
- Output parity error.

11.7.4 Verification. In addition to the line printer output defining the contents of the MERGE tape, the following action may be taken as an additional validation check:

A. Remove the write ring from the output tape mounted on MTAO.

B. Mount a sratch tape with write ring on MTO.

C. Reboot the system and make the following console inputs:

```
$AS MTA0:,IN<CR>
$AS MT0:,OUT<CR>
$RU MCOPY<CR>
```

D. When the tape copy is complete, examine the line printer output. If no read parity error messages appear, and 15 EOF's are found, then the MERGE tape is good.

11.8 SEDSUM

11.8.1 SEDSUM Description. The SEDSUM program is a standalone tape delog program that uses the SEDS data base tape as an input tape. SEDSUM outputs two products, an online tabulation and a 9-track tape of data averaged from each active channel in the data base along with the average of the corresponding growth potential for each channel. The following hardware configuration is required for operation of the SEDSUM program.

- DK0: SEDSPR2 production disk
- DK1: Scratch disk with at least 3575 free contiguous blocks of core space.
- MTX: One magnetic tape unit assigned to logical unit 9 (input)
- MTX: One magnetic tape unit assigned to logical unit 10 (output)
- KB: DECwriter keyboard
- CR: Card reader
- LP: Line printer.

A sample run deck is as shown:

```
$JOB NAME [210,50]
$AS MT1:,9_____$AS MTO:,10
$RU SEDSUM.LDA
  ? ? ?
DATA CARDS
  ? ? ?
$FI
```

See tables 11-4, 11-5, and figure 11-5 for a typical tabout of the SEDSUM program. Table 11-4 shows a lead card setup for the SEDSUM program; table 11-5 gives a cross reference of sector numbers and county names; and figure 11-5 shows a record layout of the output 9-track tape.

TABLE 11-4
LEAD CARD SETUP FOR SEDSUM

CARD TYPE	MNEMONIC	COLUMNS	FORMAT	RANGE	DESCRIPTION
1	IFILE	1-5	I5	1-32767	REQUESTED FILE NO. OF INPUT TAPE
2*	ISECT	1-3	I3	1-254	SECTOR NO.
	ISCAN (1)	5-7	I3	1-275	SCAN LINE NO.
	ISRT (1)	9-11	I3	1-625	START PIXEL NO.
	ISTP (1)	13-15	I3	1-625	STOP PIXEL NO.
	ISCAN (2)	17-19	I3	1-275	SCAN LINE NO.
	ISRT (2)	21-23	I3	1-625	START PIXEL NO.
	ISTP (2)	25-27	I3	1-625	STOP PIXEL NO.
	ISCAN (3)	29-31	I3	1-275	SCAN LINE NO.
	ISRT (3)	33-35	I3	1-625	START PIXEL NO.
	ISTP (3)	37-39	I3	1-625	STOP PIXEL NO.
	ISCAN (4)	41-43	I3	1-275	SCAN LINE NO.
	ISRT (4)	45-47	I3	1-625	START PIXEL NO.
	ISTP (4)	49-51	I3	1-625	STOP PIXEL NO.
	ISCAN (5)	53-55	I3	1-275	SCAN LINE NO.
	ISRT (5)	57-59	I3	1-625	START PIXEL NO.
	ISTP (5)	61-63	I3	1-625	STOP PIXEL NO.
	ISCAN (6)	65-67	I3	1-275	SCAN LINE NO.
	ISRT (6)	69-71	I3	1-625	START PIXEL NO.
	ISTP (6)	73-75	I3	1-625	STOP PIXEL NO.

*CARD TYPE 2 IS REPEATED FOR EACH SECTOR IN A GIVEN RUN. THE MAXIMUM NUMBER OF SETS OF PIXELS REQUESTED PER SECTOR IS 50; A SET OF PIXEL REQUESTS INCLUDES A SCAN LINE NUMBER, START PIXEL NUMBER, AND STOP PIXEL NUMBER. THE END OF A SECTOR IS DENOTED BY A BLANK OR ZERO VALUE FOR THE SCAN LINE NUMBER OR A SECTOR NUMBER DIFFERENT FROM THE PREVIOUS SECTOR NUMBER READ. THERE IS NO LIMIT TO THE MAXIMUM NUMBER OF SECTORS THAT CAN BE PROCESSED IN A GIVEN RUN. DATA CARDS WILL BE SUPPLIED BY LOCKHEED CORPORATION.

TABLE 11-5

CROSS REFERENCE OF SECTOR NUMBERS AND COUNTY NAMES

NO.	COUNTY	NO.	COUNTY
1	ANDERSON	44	COLLINGSWORTH
2	ANDREWS	45	COLORADO
3	ANGELINA	46	COMAL
4	ARANSAS	47	COMANCHE
5	ARCHER	48	CONCHO
6	ARMSTRONG	49	COOKE
7	ATASCOSA	50	CORYELL
8	AUSTIN	51	COTTLE
9	BAILEY	52	CRANE
10	BANDERA	53	CROCKETT
11	BASTROP	54	CROSBY
12	BAYLOR	55	CULBERSON
13	BEE	56	DALLAM
14	BELL	57	DALLAS
15	BEXAR	58	DAWSON
16	BLANCO	59	DEAF SMITH
17	BORDEN	60	DELTA
18	BOSQUE	61	DENTON
19	BOWIE	62	DE WITT
20	BRAZORIA	63	DICKENS
21	BRAZOS	64	DIMMIT
22	BREWSTER	65	DONLEY
23	BRISCOE	66	DUVAL
24	BROOKS	67	EASTLAND
25	BROWN	68	ECTOR
26	BURLESON	69	EDWARDS
27	BURNET	70	ELLIS
28	CALDWELL	71	EL PASO
29	CALHOUN	72	ERATH
30	CALLAHAN	73	FALLS
31	CAMERON	74	FANNIN
32	CAMP	75	FAYETTE
33	CARSON	76	FISHER
34	CASS	77	FLOYD
35	CASTRO	78	FOARD
36	CHAMBERS	79	FORT BEND
37	CHEROKEE	80	FRANKLIN
38	CHILDRESS	81	FREESTONE
39	CLAY	82	FRIO
40	COCHRAN	83	GAINES
41	COKE	84	GALVESTON
42	COLEMAN	85	GARZA
43	COLLIN	86	GILLESPIE

TABLE 11-5 (CONT'D)

NO.	COUNTY	NO.	COUNTY
87	GLASSCOCK	130	KENDALL
88	GOLIAD	131	KENEDY
89	GONZALES	132	KENT
90	GRAY	133	KERR
91	GRAYSON	134	KIMBLE
92	GREGG	135	KING
93	GRIMES	136	KINKEY
94	GUADALUPE	137	KLEBERG
95	HALE	138	KNOX
96	HALL	139	LAMAR
97	HAMILTON	140	LAMP
98	HANSFORD	141	LAMPASAS
99	HARDEMAN	142	LA SALLE
100	HARDIN	143	LAVACA
101	HARRIS	144	LEE
102	HARRISON	145	LEON
103	HARTLEY	146	LIBERTY
104	HASKELL	147	LIMESTONE
105	HAYS	148	LIPSCOMB
106	HEMPHILL	149	LIVE OAK
107	HENDERSON	150	LLANO
108	HIDALGO	151	LOVING
109	HILL	152	LUBBOCK
110	HOCKLEY	153	LYNN
111	HOOD	154	MCCULLOCH
112	HOPKINS	155	MCLENNAN
113	HOUSTON	156	MCMULLEN
114	HOWARD	157	MADISON
115	HUDSPETH	158	MARION
116	HUNT	159	MARTIN
117	HUTCHINSON	160	MASON
118	IRION	161	MATAGORDA
119	JACK	162	MAVERICK
120	JACKSON	163	MEDINA
121	JASPER	164	MENARD
122	JEFF DAVIS	165	MIDLAND
123	JEFFERSON	166	MILAM
124	JIM HOGG	167	MILLS
125	JIM WELLS	168	MITCHELL
126	JOHNSON	169	MONTAGUE
127	JONES	170	MONTGOMERY
128	KARNES	171	MOORE
129	KAUFMAN		

TABLE 11-5 (CONT'D)

NO.	COUNTY	NO.	COUNTY
172	MORRIS	214	STARR
173	MOTLEY	215	STEPHENS
174	NACOGDOCHES	216	STERLING
175	NAVARRO	217	STONEWALL
176	NEWTON	218	SUTTON
177	NOLAN	219	SWISHER
178	NUECES	220	TARRANT
179	OCHILTREE	221	TAYLOR
180	OLDHAM	222	TERRELL
181	ORANGE	223	TERRY
182	PALO PINTO	224	THROCKMORTON
183	PANOLA	225	TITUS
184	PARKER	226	TOM GREEN
185	PARMER	227	TRAVIS
186	PECOS	228	TRINITY
187	POLK	229	TYLER
188	POTTER	230	UPSHUR
189	PRESIDIO	231	UPTON
190	RAINS	232	UVALDE
191	RANDALL	233	VAL VERDE
192	REAGAN	234	VAN ZANDT
193	REAL	235	VICTORIA
194	RED RIVER	236	WALKER
195	REEVES	237	WALLER
196	REFUGIO	238	WARD
197	ROBERTS	239	WASHINGTON
198	ROBERTSON	240	WEBB
199	ROCKWALL	241	WHARTON
200	RUNNELS	242	WHEELER
201	RUSK	243	WICHITA
202	SABINE	244	WILBARGER
203	SAN AUGUSTINE	245	WILLACY
204	SAN JACINTO	246	WILLIAMSON
205	SAN PATRICIO	247	WILSON
206	SAN SABA	248	WINKLER
207	SCHLEICHER	249	WISE
208	SCURRY	250	WOOD
209	SCHACKELFORD	251	YOAKUM
210	SHELBY	252	YOUNG
211	SHERMAN	253	ZAPATA
212	SMITH	254	ZAVALA
213	SOMERVELL		

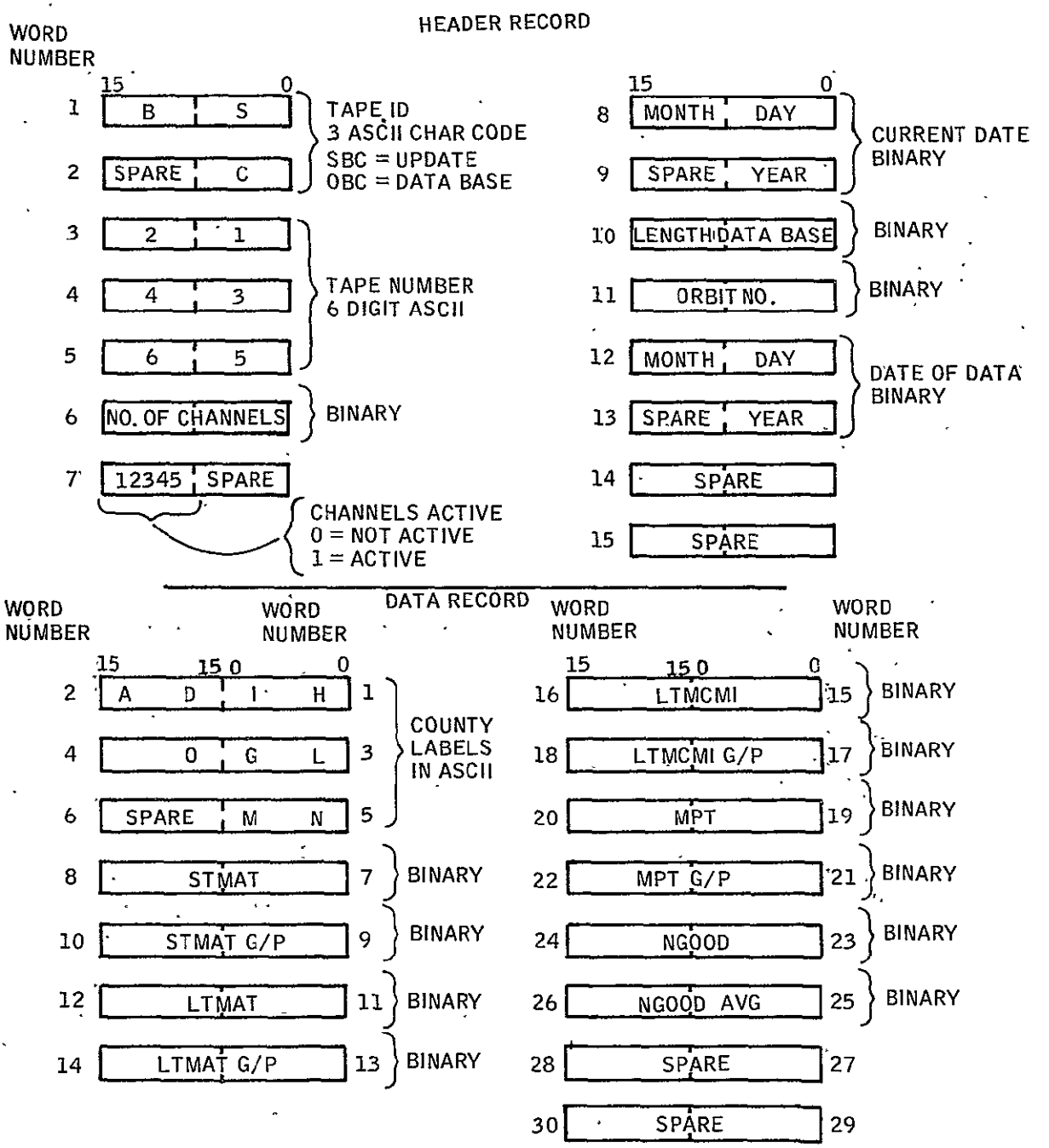


Figure 11-5 Record Layout of
Output 9-Track Tape

11.8.2 Run Time and Error Messages. Run time for a typical job is approximately five minutes. Error messages and their causes are listed below.

MESSAGE	REASON
Tape ID does not match ID = XXXX	Input tape is not on OBC or SBC delog tape
Unable to allocate disk file by NTRAN, STAT = XXX	Not enough free disk space on DK1:
Unable to read record #, XXX STAT = XXX	Record number requested is larger than the last record on tape for the file requested.
Unable to read disk record # XXX STAT = XXX	Record number requested is larger than the last record on disk for the file requested.
NTRAN error STAT = XXXX	Input tape read error, date transfer error
End of disk file	Reach the end of the disk file before the present scan line was processed.
Card input err: start pixel # XXXX is greater than stop pixel # XXXX of sector # XXXX	Input card error, start pixel number is greater than the stop pixel number of indicated sector number

Any of the above error conditions will cause program termination, and the program must be reinitiated when errors are corrected to continue.

SECTION 12

SEDS MAINTENANCE PROCEDURES

12.1 PRODUCTION DISK GENERATION

As new development and changes are implemented to the SEDS, in accordance with NASA, new production disks will be generated for delivery. The following procedures will be taken to generate a new production disk.

A. The programmers development disk containing the current production system on which the changes and new development were implemented and checked out is to be loaded on DKO with WRITE PROTECT enabled.

B. A production disk supplied by the DPCA, on which the new system is to be transferred, is loaded on DK1. To date, there are two SEDS production disks. When a new version is to be delivered the older version of the two production disks will be used as the 'scratch' disk on DK1 to tranfer the new system.

C. The responsible programmer will create the new disk by performing roll out as follows:

- Boot the system to bring DOS in
- Key the following in on the DECwriter

```
$LO 20,20 <CR>
$AS ROLLIN, DIA <CR>
$RU DIAG <CR>
#DK1:  <DKO:  <CR>
```

This creates on DK1 an exact copy of the disk on DKO. Roll out is complete when an # is printed on the DECwriter.

There are several files on disk used by the SEDS programs that must be carried from production disk to production disk. The first file is METLOC.TBL [300,300] containing the Mexican Meteorological Station locations. The second file is DBINFO.TBL [300,300] containing the current data base size and the update tape numbers. The third file is RFCOEF.TBL [300,300] that contains the rainfall coefficients. The fourth file is AIKSWP.TBL [200,200] that contains the six screwworm constants for the output product.

The most current production disk will be used from which to retrieve these files for transfer to the newly created disk for delivery. The following procedures result in transferring these files:

- Load the newly created disk on DK0
- Load the most current production disk on DK1
- Disable WRITE PROTECT on DK0
- Boot the system
- Key in the following on the DECwriter

```
$LO 300,300 <CR>
$RU PIP     <CR>
#DBINFO.TBL/CD<DK1:DBINFO.TBL <CR>
```

NOTE: Transfer is completed when # is returned to the DECwriter.

```
#METLOC.TBL/CD<DK1:METLOC.TBL <CR>
#RFCOEF.TBL/CD<DK1:RFCOEF.TBL <CR>
#CNTL C
 KI     <CR>
$FI     <CR>

$LO 200,200 <CR>
$RU PIP     <CR>
#AIKSWP.TBL/CD<DK1:AIKSWP.TBL  CR
#CNTL C
 KI     <CR>
$FI     <CR>
```

The transfer of the four files is now complete.

The most current delta T image file on the system production disk must also be transferred to the newly released production disk. This file is the SEDDLT.DAT under UIC [150,150]. To transfer this file the steps are outlined below.

```
#LO 150,150  <CR>
$RU PIP
#DK0:  SEDDLT.DAT/DE  (deletes file off new disk)
#DK0:  SEDDLT.DAT/CO<DK1:  SEDDLT.DAT  <CR>
#CNTL C
 KI
Where:  DK0 is the new production disk for release; and
        DK1 is the previous production system disk
```

The only thing left to do to the new disk is to generate the ephemeris data files. This is done by following the procedures outlined in paragraphs 11.4 and 11.5.

12.2 BACKUP SYSTEM

As a new disk is QT'd and released for production a backup system should be provided for the released version. The backup system is usually a 9-track tape containing a roll out of the new production disk version. This is accomplished as follows.

- Load the new production disk on DK0
- Mount a certified 9-track tape on a magnetic tape unit, say MT0
- Boot the system to bring in DOS
- Key in the following on the DECwriter

```
$LO 20,20 <CR>
$AS ROLLIN, DIA
$RU DIAG
#MT0:FILE NAME<DK0:
```

Roll in is complete when an # is printed on the DECwriter.

The disk backup tape is assigned a unique tape number along with its file name. This information should be logged for easy access should a production disk "crash" and it is necessary to create a new disk from the tape backup.

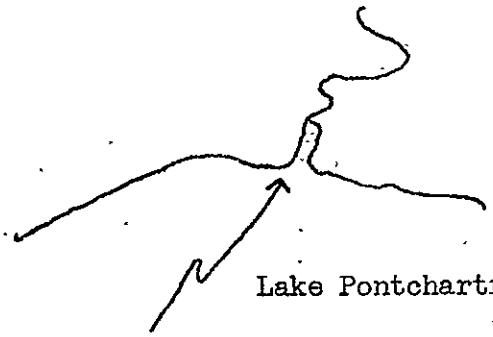
APPENDIX A

GROUND CONTROL POINTS

GROUND CONTROL ENTRY # 1

NEW ORLEANS

NORTH SHORE OF LAKE PONCHARTRAIN



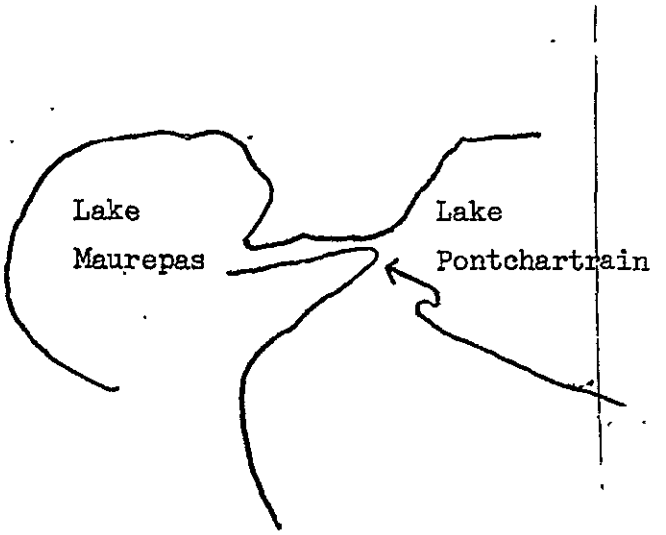
90.166W 30.378N

X = 2314.019 Y = 2216.823

GROUND CONTROL ENTRY # 2

NEW ORLEANS

INLET OF LAKE MAUREPAS INTO LAKE PONTCHARTRAIN



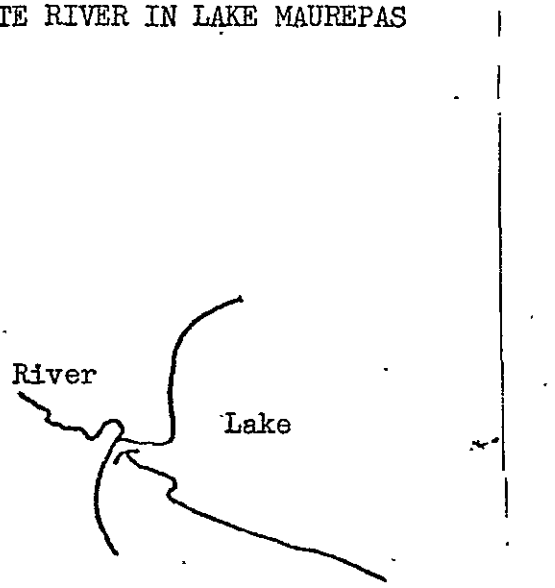
90.310W 30.287N

X = 2302.553 Y = 2201.177

GROUND CONTROL ENTRY # 3

NEW ORLEANS

MOUTH OF AMETE RIVER IN LAKE MAUREPAS



90.597W

30.207N

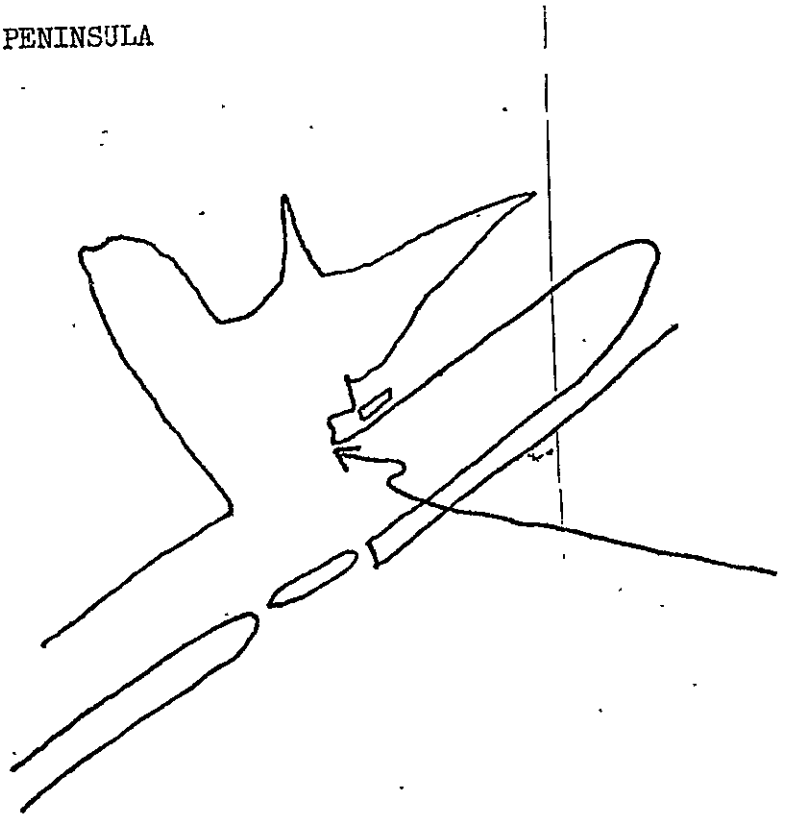
X = 2275.783

Y = 2182.150

3

GROUND CONTROL ENTRY # 8

MATAGORDA BAY
MATAGORDA PENINSULA



96.235W

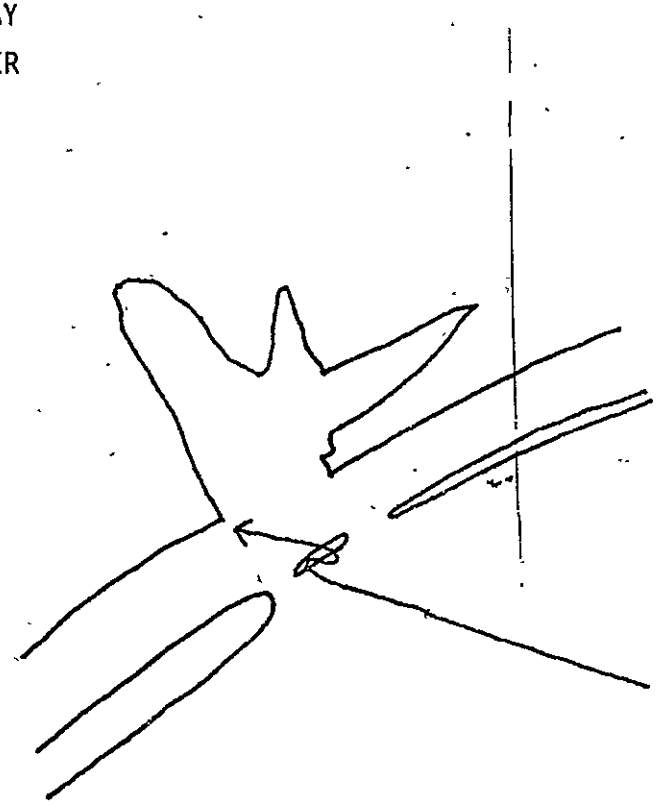
28.576N

X = 1740.057

Y = 1811.541

GROUND CONTROL ENTRY # 9

MATAGORDA BAY
PORT O'CONNER



96.404W

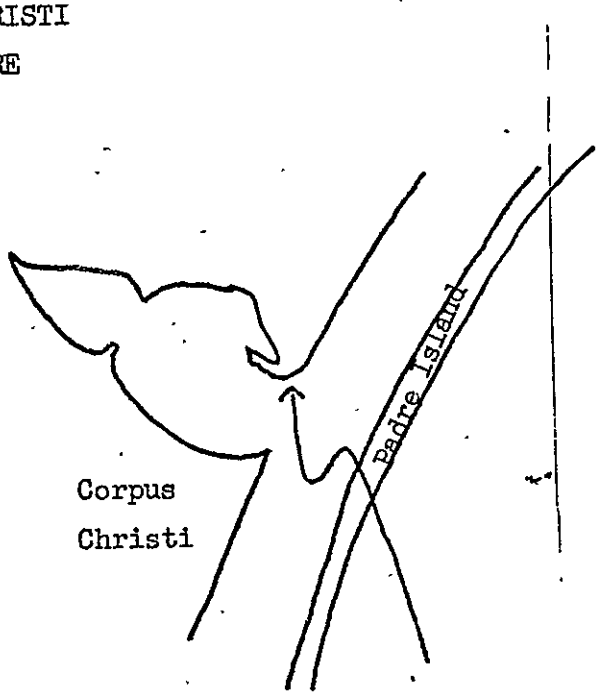
28.440N

X = 1726.501

Y = 1790.222

GROUND CONTROL ENTRY # 10

CORPUS CHRISTI
NORTH SHORE



97.209W

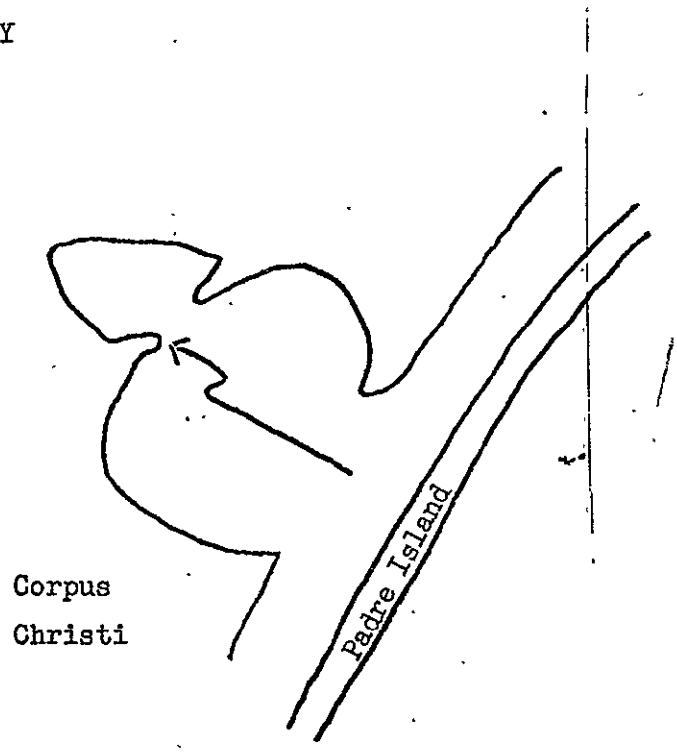
27.815N

X = 1660.562

Y = 1691.628

GROUND CONTROL ENTRY # 11

CORPUS CHRISTI
CAUSEWAY



97.379W

27.831N

X = 1641.792

Y = 1688.730

GROUND CONTROL ENTRY # 12

LAKE CORPUS CHRISTI

97.867W

28.046N

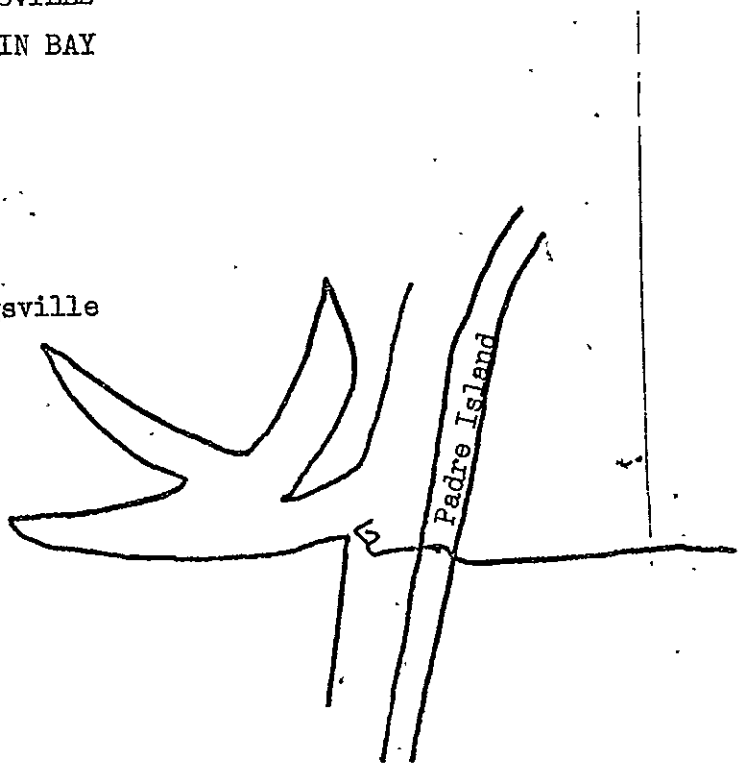
X = 1582.574

Y = 1700.996

GROUND CONTROL ENTRY # 13

KINGSVILLE

BAFFIN BAY



97.418W

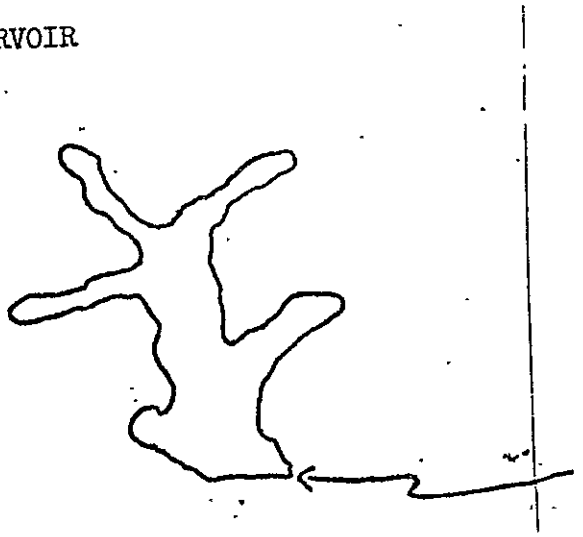
27.260N

X = 1655.784

Y = 1618.642

GROUND CONTROL ENTRY # 14

FALCON RESERVOIR



99.131W

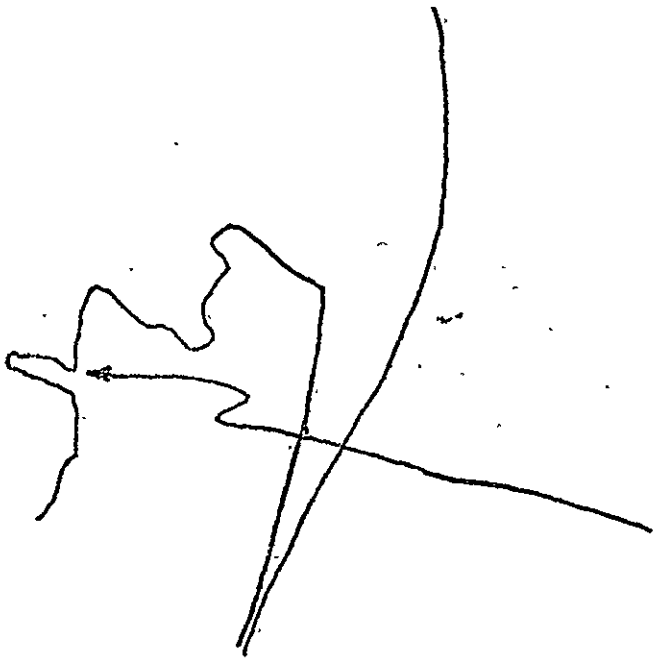
26.559N

X = 1491.885

Y = 1486.143

GROUND CONTROL ENTRY # 15

LAGUNA MADRE SOUTH OF BROWNSVILLE

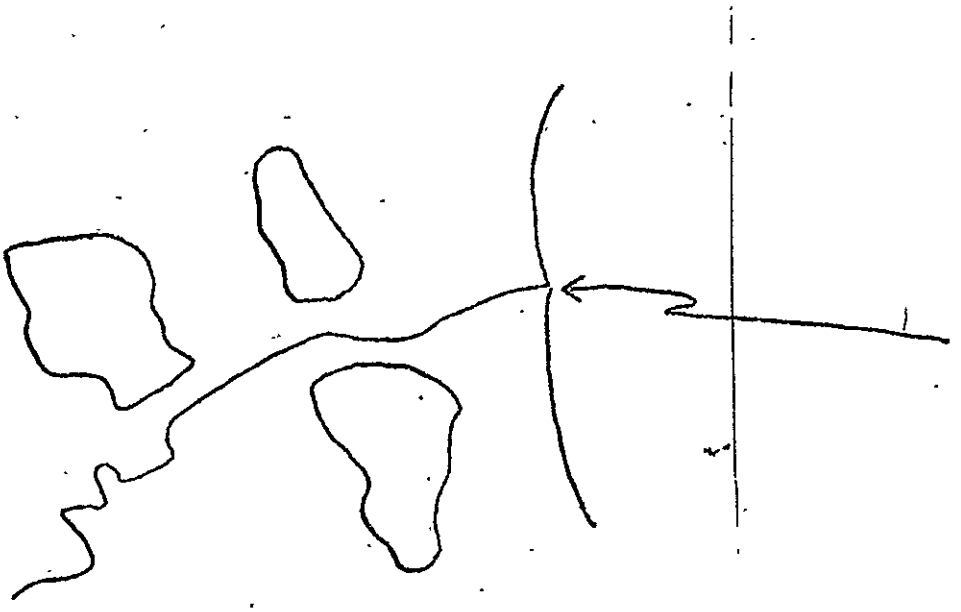


97.721W 25.250N

X = 1686.476 Y = 1367.397

GROUND CONTROL ENTRY # 16

TAMPICO



97.759W

22.259N

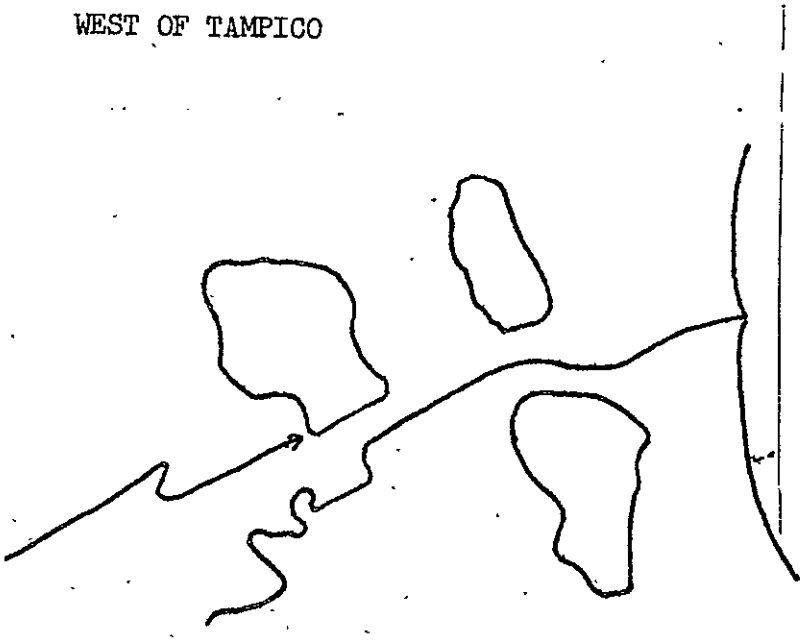
X = 1776.460

Y - 1005.555

GROUND CONTROL ENTRY # 17

LAGUNA DE TAMOS

WEST OF TAMPICO



98.044W

22.172N

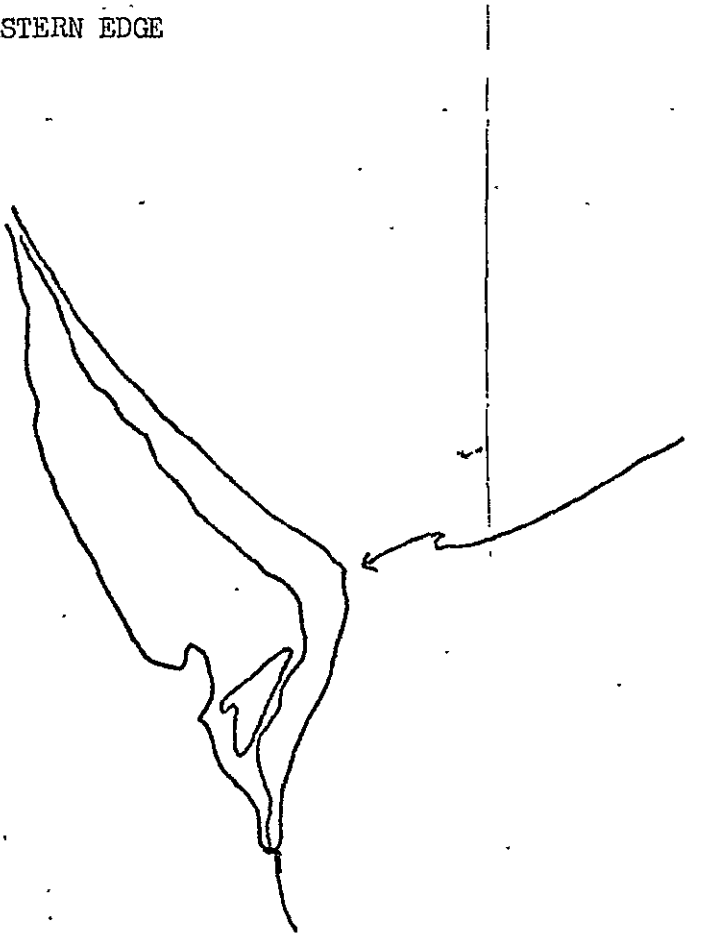
X = 1747.168

Y = 986.737

GROUND CONTROL ENTRY # 18

CABO RAYO

CENTER OF EASTERN EDGE



97.329W

21.578N

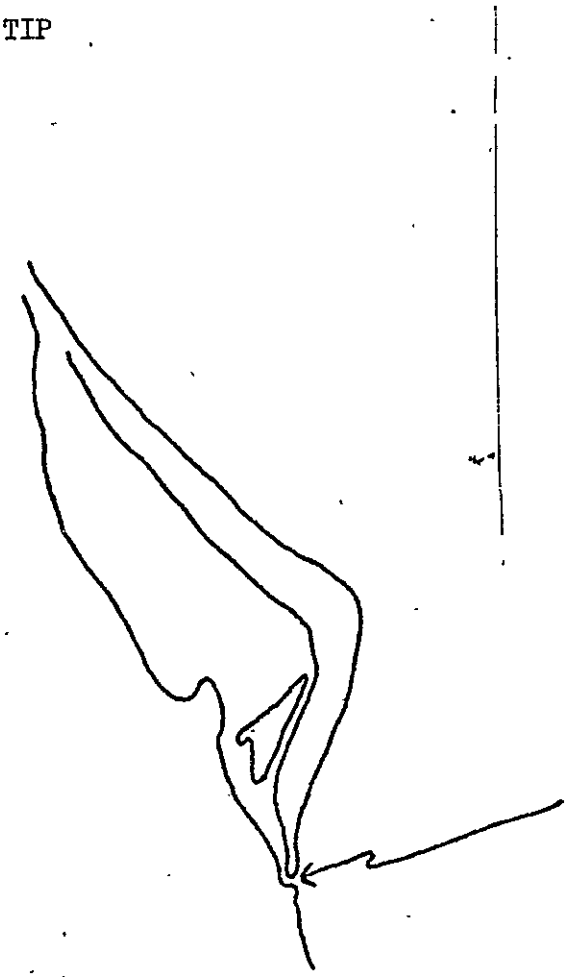
X = 1846.420

Y = 936.131

GROUND CONTROL ENTRY # 19

CABO RAYO

SOUTHERMOST TIP



97.424W

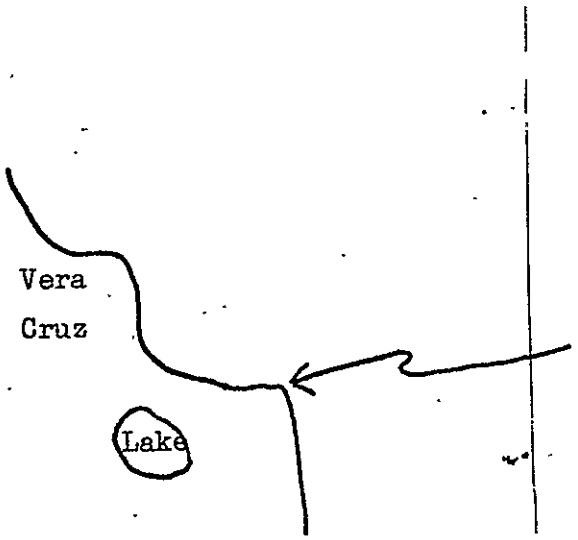
21.256N

X = 1845.940

Y = 894.469

GROUND CONTROL ENTRY # 20

VERACRUZ



95.979W

19.063N

X = 2081.615

Y = 674.297

GROUND CONTROL ENTRY # 21

VOLCAN CITLALTÉPETL (ORIZABA)

97.266W

19.009N

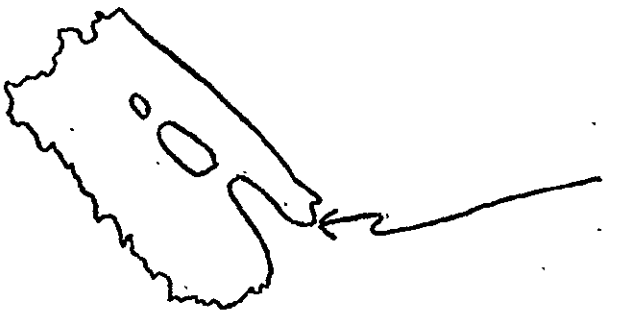
X = 1935.615

Y = 627.936

GROUND CONTROL ENTRY # 22

PRESA TEMASCAL

BIG LAKE SOUTH OF VERA CRUZ



96.364W

18.173N

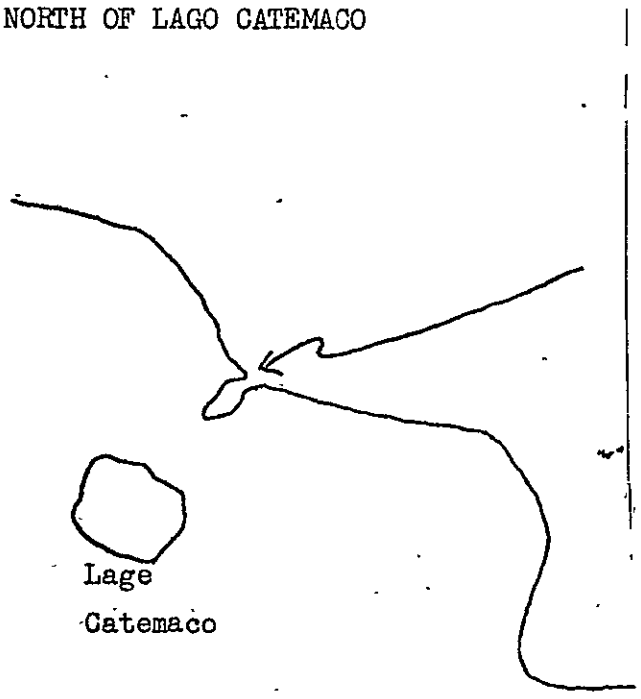
X = 2066.648

Y = 554.783

GROUND CONTROL ENTRY # 23

NORTH COAST OF ISTHMUS OF TEHUANTEPEC

BAY NORTH OF LAGO CATEMACO



94.993W 18.556N

X = 2211.760 Y = 644.697

GROUND CONTROL ENTRY # 24

ISTHMUS OF TECHANTEPEC

LAGO CATEMACO

95.121W

18.412N

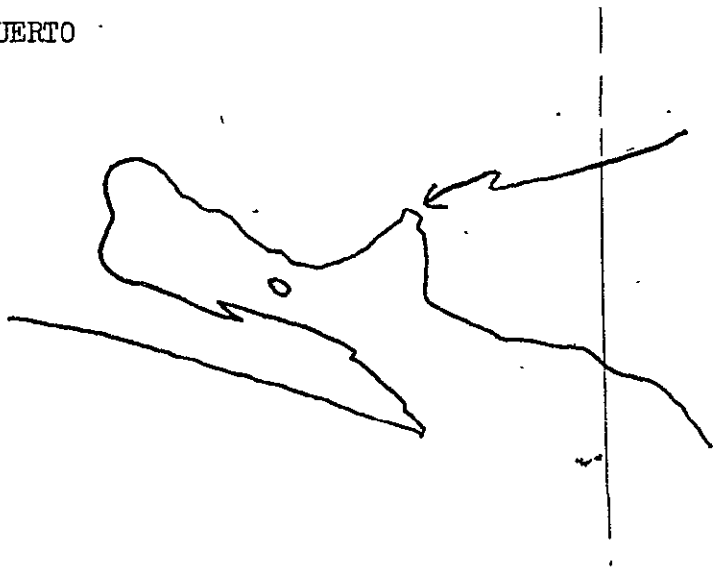
X = 2201.933

Y = 623.209

GROUND CONTROL ENTRY # 25

GULF OF TEHUANTEPEC

MAR MUERTO



94.131W

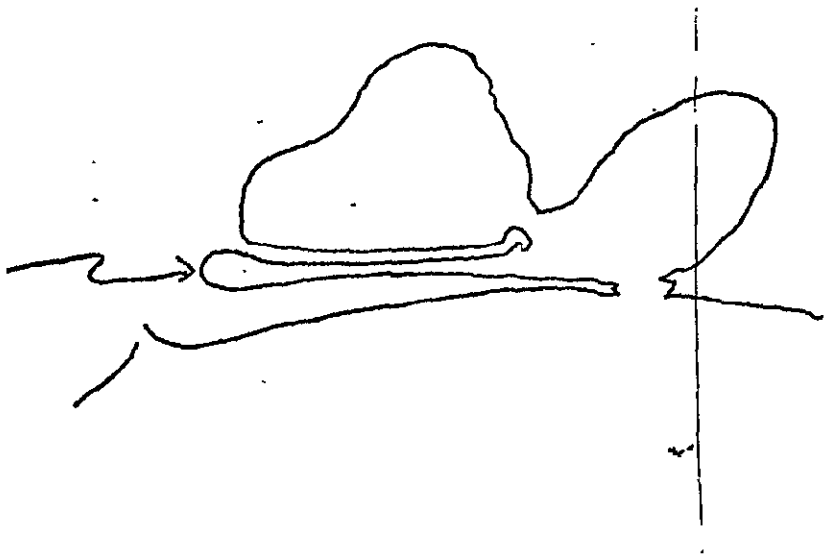
16.216N

X = 2392.065

Y = 391.056

GROUND CONTROL ENTRY # 26

GULF OF TEHUANTEPEC

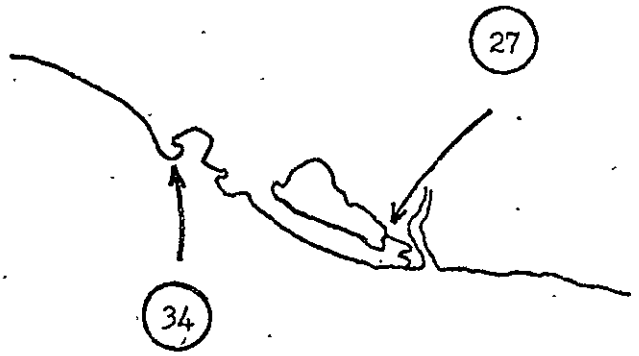


95.107W 16.238N

X = 2277.346 Y = 361.238

GROUND CONTROL ENTRY # 27 & # 34

ACAPULCO AND LAGUNA PAPAGAYO



34 Southermost tip of land by bay

27 Intersection of laguna and river

34 Acapulco 99.899W 16.821N

X = 1697.330 Y = 284.424

#27 Laguna Papagayo 99.659W 16.732N

X = 1729.235 Y = 280.761

GROUND CONTROL ENTRY # 28

OLCAN POPOCATEPETL

)8.600W

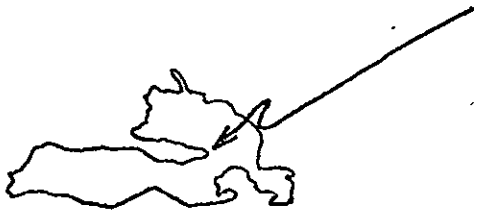
19.023N

(= 1781.620

Y = 589.756

GROUND CONTROL ENTRY # 29

LAGO DE CUITZEO



101.064W

19.958N

X - 1470.199

Y = 633.658

GROUND CONTROL ENTRY # 30

VOLCAN DE COLIMA

103.609W

19.570N

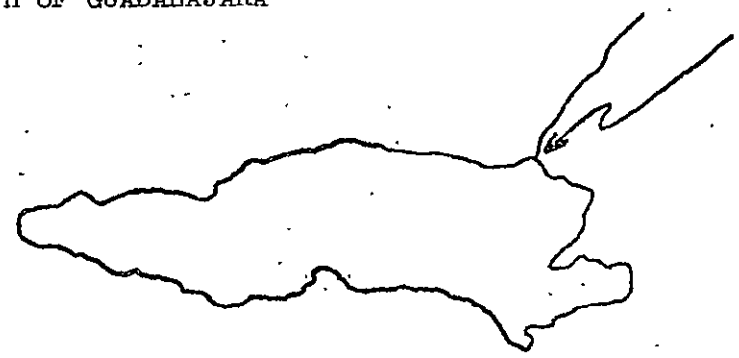
X = 1187.370

Y = 519.900

GROUND CONTROL ENTRY # 31

LAGO DE CHAPALA

SOUTH OF GUADALAJARA



102.796W

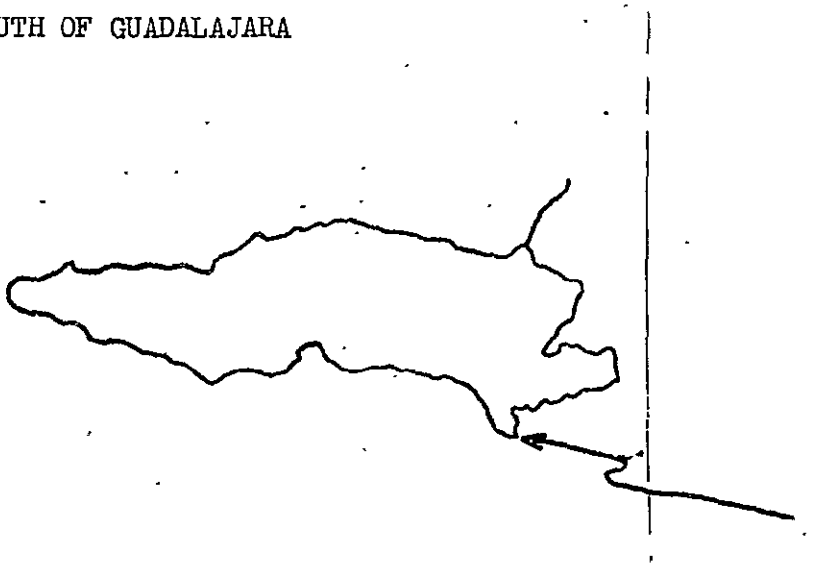
20.319N

X = 1261.039

Y = 631.895

GROUND CONTROL ENTRY # 32

LAGO DE CHAPALA
SOUTH OF GUADALAJARA



102.813W

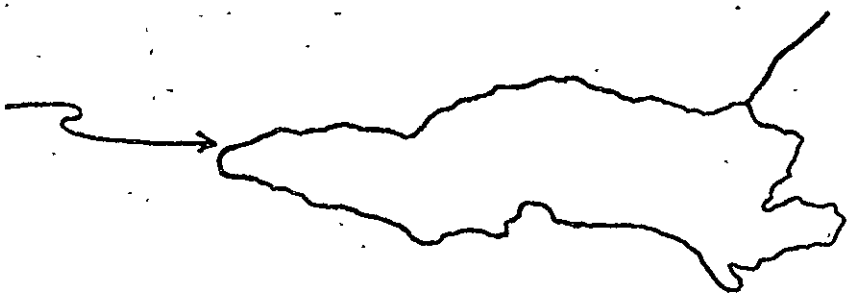
20.100N

X - 1265.035

Y = 604.771

GROUND CONTROL ENTRY # 33

LAGO DE CHAPALA



103.421W

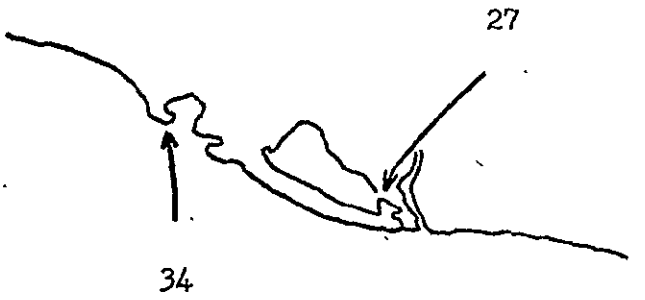
20.264N

X = 1190.629

Y = 609.320

GROUND CONTROL ENTRY # 27 & # 34

ACAPULCO AND
LAGUNA PAPAGAYO



34 Southermost tip of land by bay

27 Intersection of laguna and river

34

Acapulco	99.899W	16.821N
	X = 1697.330	Y = 284.424

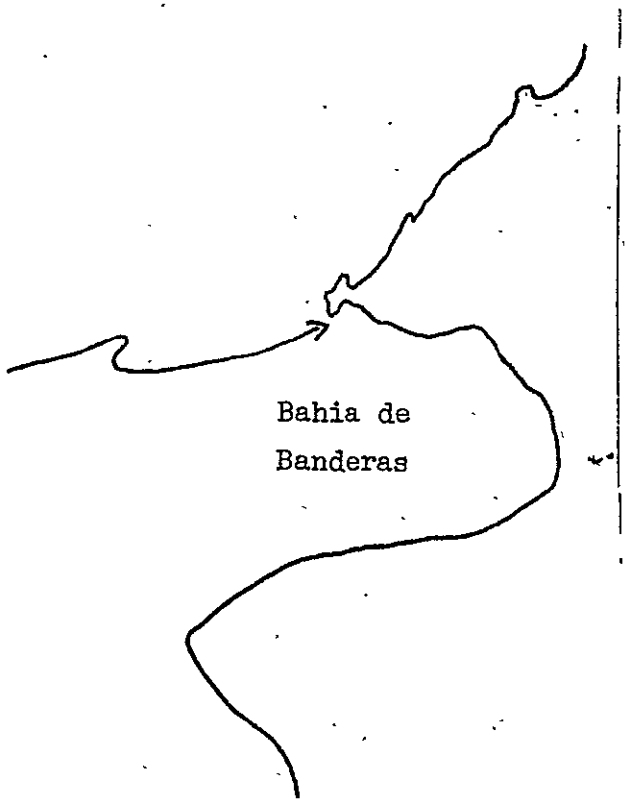
27

Laguna Papagayo	99.650W	16.732N
	X = 1729.235	Y = 280.761

GROUND CONTROL ENTRY # 35

(NEW LOCATION)

BAHIA DE BANDERAS



105.534W

20.776N

X = 934.326

Y = 620.657

GROUND CONTROL ENTRY # 36

BAJA CALIFORNIA

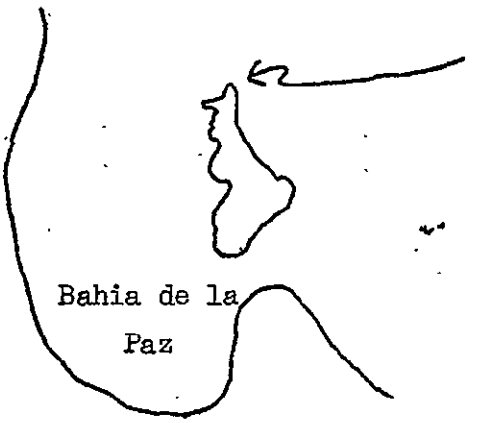
ISLA CERRALVO

109.924W 24.380N

X = 352.460 Y = 969.140

GROUND CONTROL ENTRY # 37

BAJA CALIFORNIA
ISLA DEL ESPIRITU SANTO
BAHIA DE LA PAZ



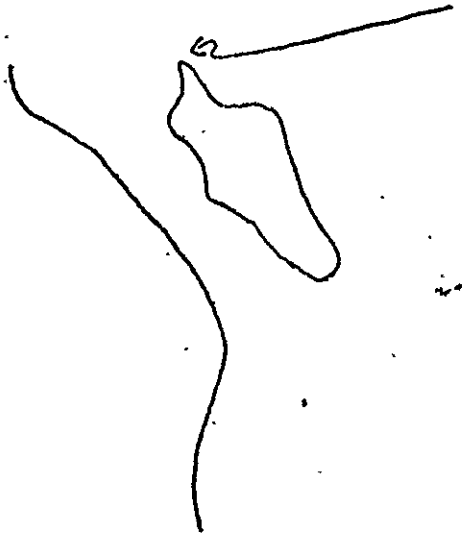
110.390W 24.594N

X = 295.505 Y = 986.600

GROUND CONTROL ENTRY # 38

BAJA CALIFORNIA

ISLA SAN JOSE



110.708W

25.100N

X - 247.496

Y = 1042.912

GROUND CONTROL ENTRY # 39

LAGUNA DE SANTIAGUILLO

DRY LAKE NORTH OF DURANGO

104.682W

24.699N

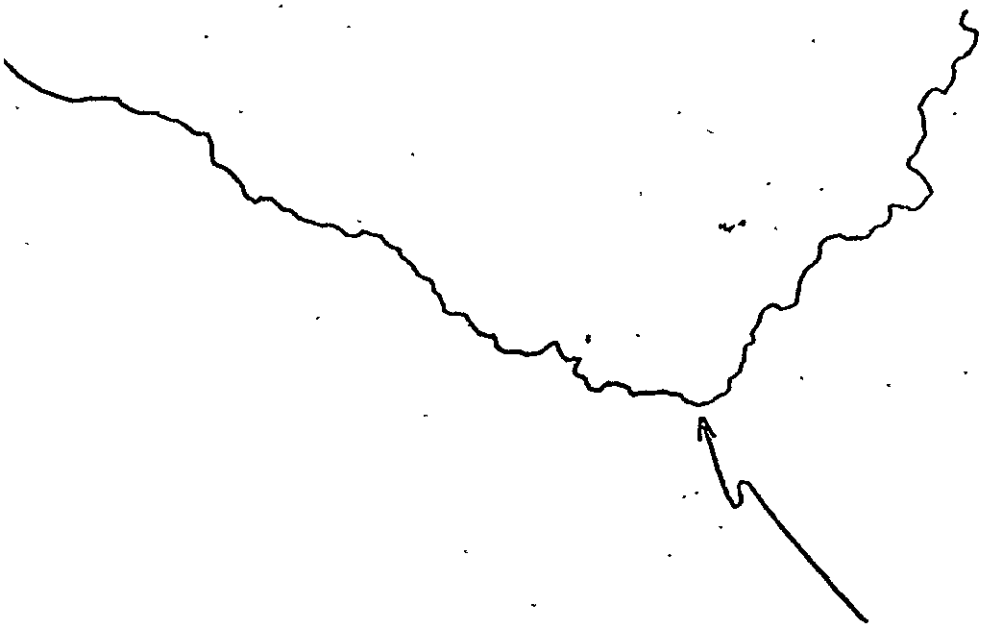
X = 932.182

Y = 1119.583

GROUND CONTROL ENTRY # 40

BIG BEND

MARRECAL CANYON



103.152W 28.974N

X =987.636 Y = 1677.461

GROUND CONTROL ENTRY # 41

LAKE AMISTAD

EAST END OF DAM

101.039W

29.453N

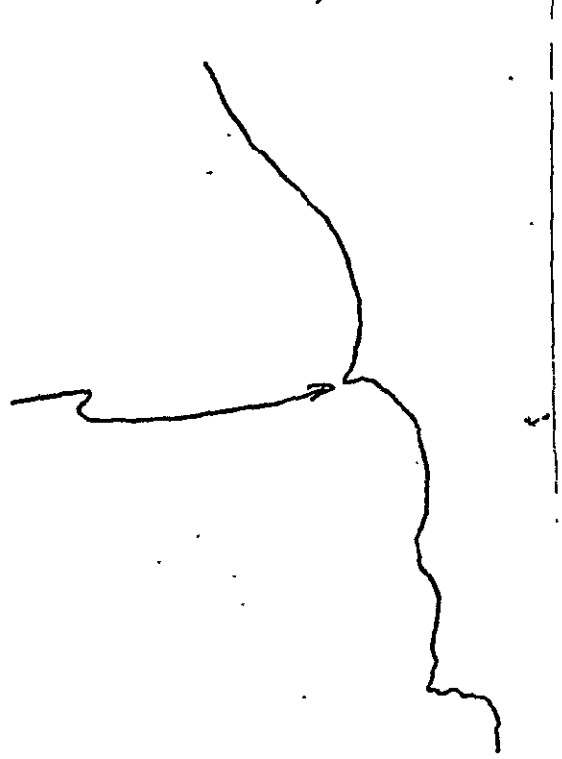
X = 1200.628

Y = 1787.627

GROUND CONTROL ENTRY # 42

CABO TEPOCA

IN UPPER GULF OF CALIFORNIA, NORTH OF TWO ISLANDS



112.862W

30.269N

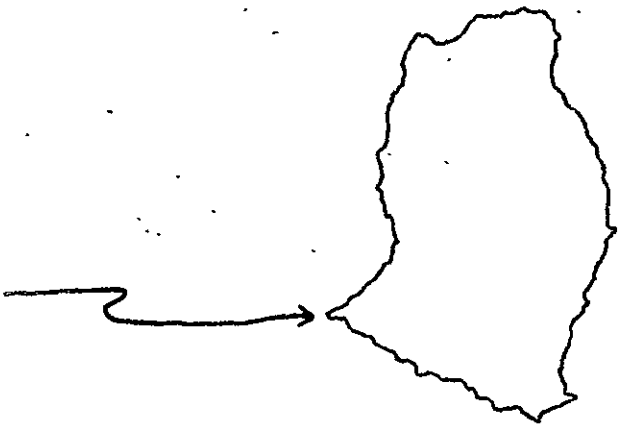
X = -87.326

Y = 1644.102

GROUND CONTROL ENTRY # 43

ISLA TIBURON

IN UPPER GULF OF CALIFORNIA



112.580W

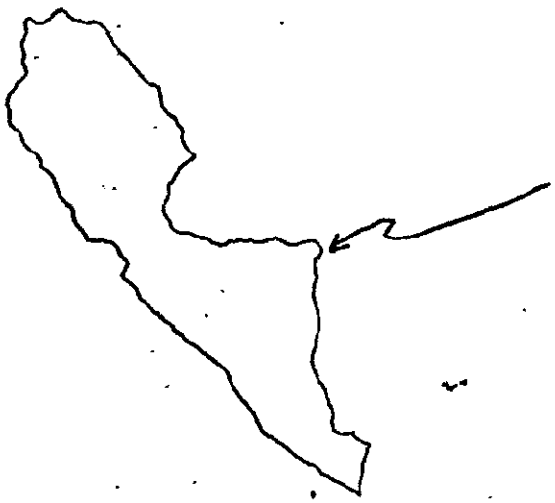
28.876N

X = -30.867

Y = 1476.028

GROUND CONTROL ENTRY # 44

ISLA ANGEL DE LA GUARDA
IN UPPER GULF OF CALIFORNIA

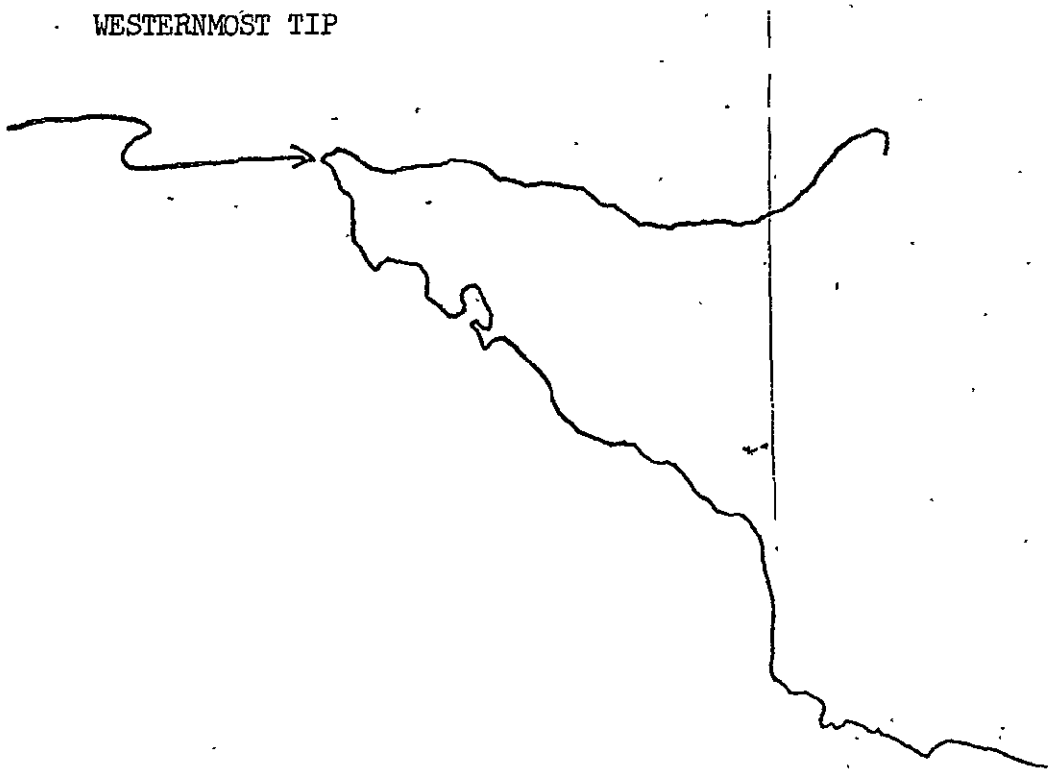


113.190W 29.288N

X = -104.828 Y = 1517.176

GROUND CONTROL ENTRY #

POINT ON WEST COAST OF BAJA
WESTERNMOST TIP



115.071W

27.848N

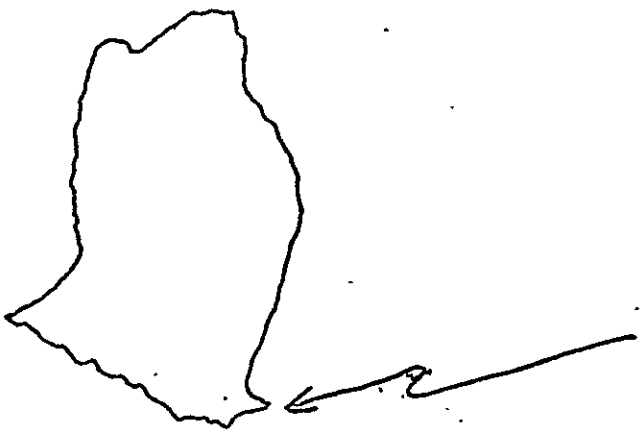
X = -285.641

Y = 1309.986

GROUND CONTROL ENTRY # 46

ISLA TIBURON

PUNTA AST AH KEEM



112.249W

28.773N

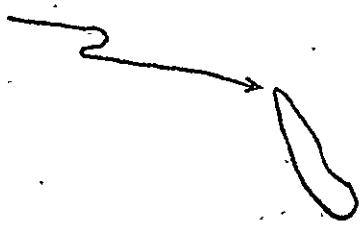
X = 7.142

Y = 1468.777

GROUND CONTROL ENTRY # 2

LAGUNA BUSTILLOS

(LAKE NEAR CHIHUAHUA WEST OF CHIHUAHUA)



106.780W

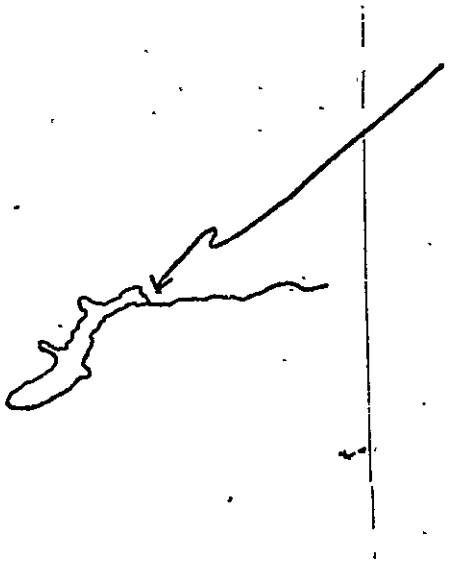
28.594N

X = 605.559

Y = 1549.831

GROUND CONTROL ENTRY # 48

LAGUNA DELICIAS
(SOUTH OF CHIHUAHUA)



105.630W

28.161N

X = 740.864

Y = 1521.384

GROUND CONTROL ENTRY # 4

LAGO TORONTO

BY LA BOQUILLA

105.562W

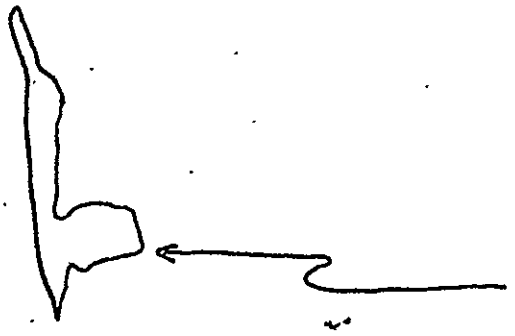
27.556N

X = 763.260

Y = 1448.764

GROUND CONTROL ENTRY # 50

PRESA EL PALMITO



105.013W

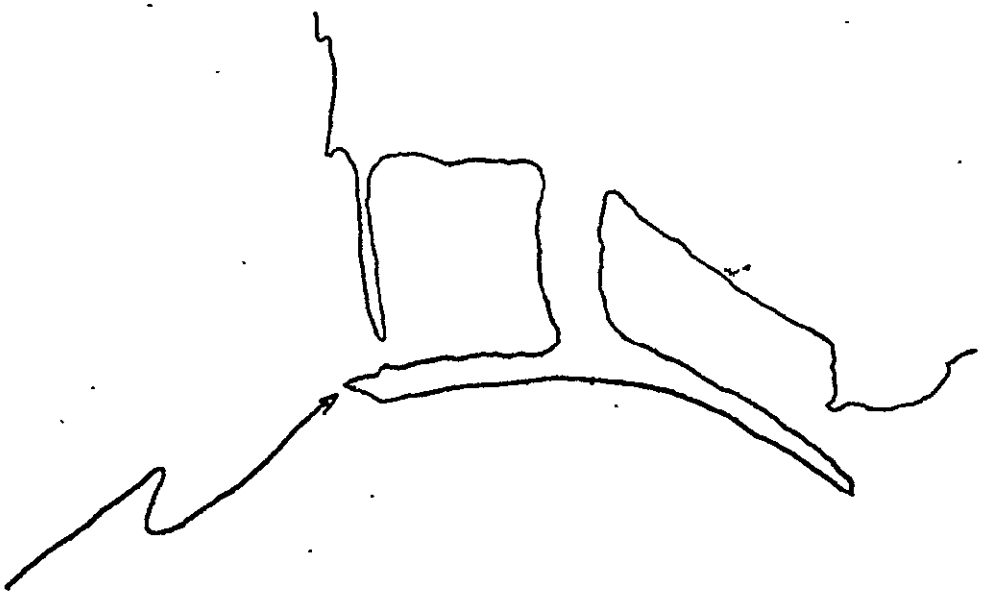
25.579N

X = 873.075

Y = 1219.365

GROUND CONTROL ENTRY #

ISLA SANTA MARIA
SOUTH OF LOS MOCHIS



109.401W

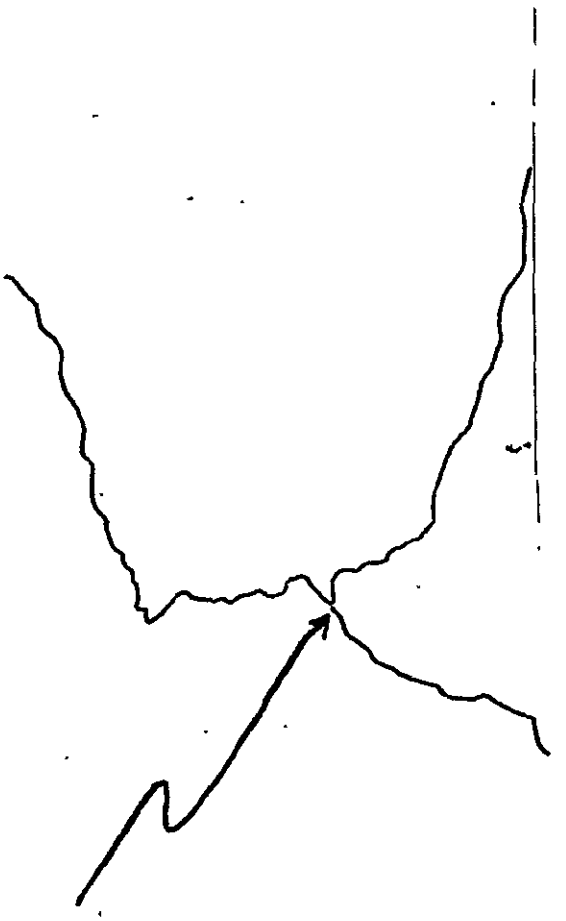
25.639N

X = 384.256

Y = 1133.921

GROUND CONTROL ENTRY # 52

CANYON NORTH OF GUADALAJARA
EAST FORK



104.086W

21.189N

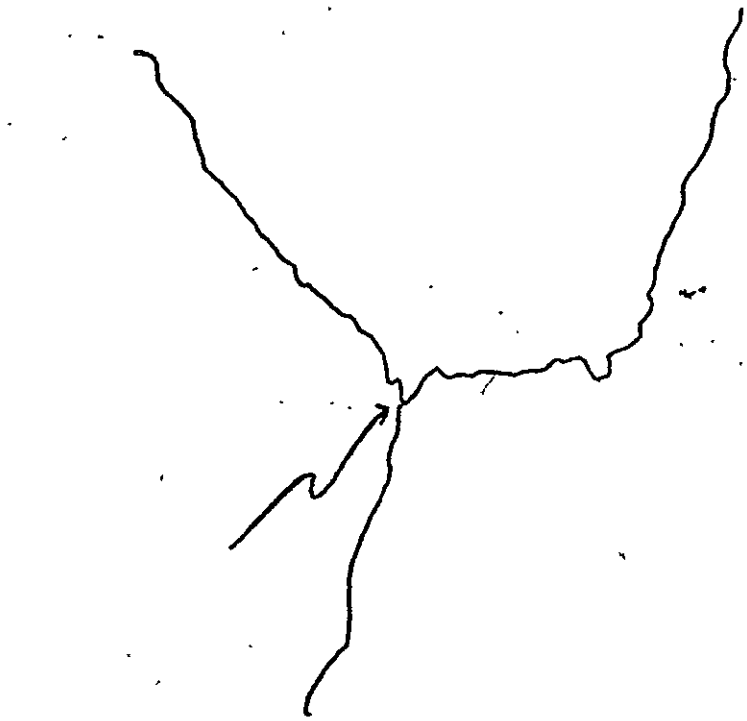
X = 1089.946

Y = 705.676

GROUND CONTROL ENTRY # 5

CANYON NORTH OF GUADALAJARA

SOUTHWEST EDGE



104.231W

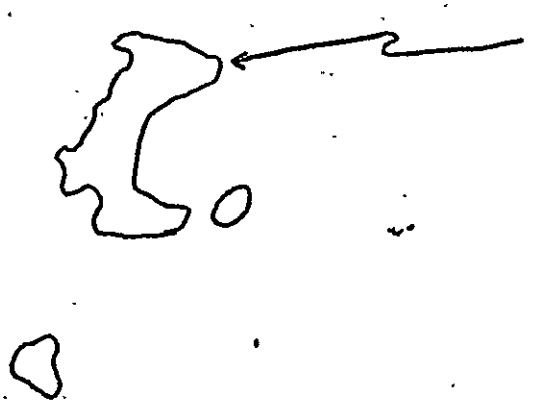
21.183N

X = 1073.508

Y = 701.412

GROUND CONTROL ENTRY # 54

LAGO DE PATZCUARO



101.542W

19.648N

X = 1424.008

Y = 583.068

GROUND CONTROL ENTRY # 55

PRESA MIGUEL HIDALGO LAKE (315)

108.583W

26.504N

X = 456.169

Y = 1256.264

GROUND CONTROL ENTRY # 56

PRESA OBREGON

109.928W

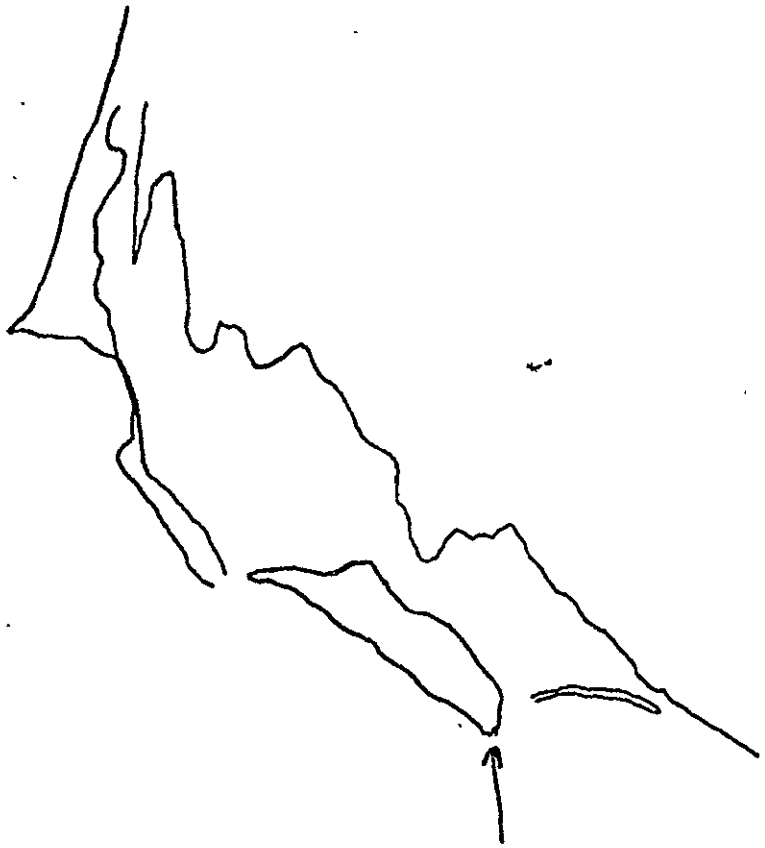
27.840N

X = 279.387

Y = 1394.659

GROUND CONTROL ENTRY # 5

ISLA SANTA MARGARITA (BAJA)



111.712W

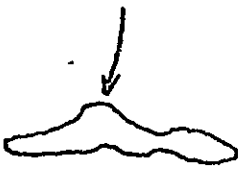
24.327N

X = 151.942

Y = 929.597

GROUND CONTROL ENTRY # 58

LAGUNA DEL CUERVO



105.879W

29.324N

X = 685.282

Y = 1658.643

GROUND CONTROL ENTRY # 59

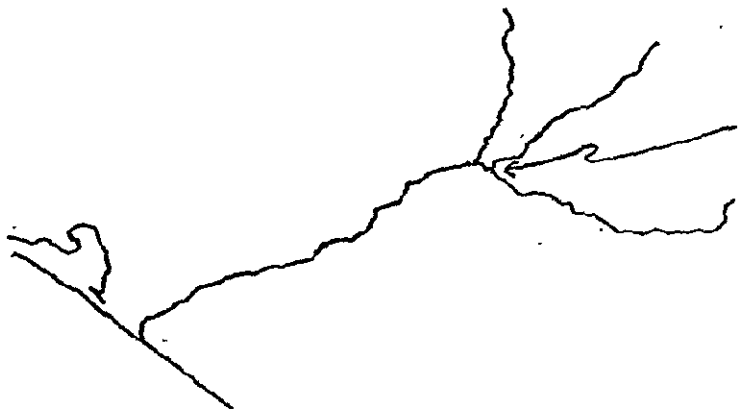
PUNTA CONCEPCION

111.248W 26.896N

X = 87.088 Y = 1243.762

GROUND CONTROL ENTRY # 60

RIVER FORK



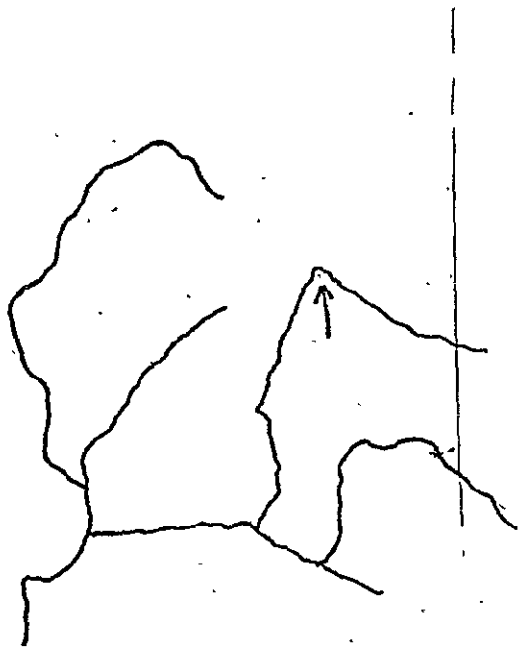
106.488W

24.693N

X = 730.733

Y = 1078.056

GROUND CONTROL ENTRY # 61



107.749W

27.527N

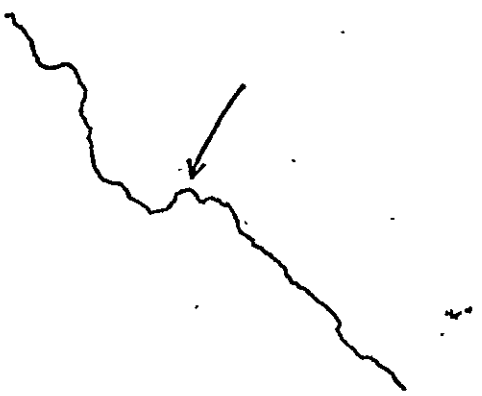
X = 524.875

Y = 1398.722

GROUND CONTROL ENTRY # 62

PUNTA FINAL

EAST BAJA



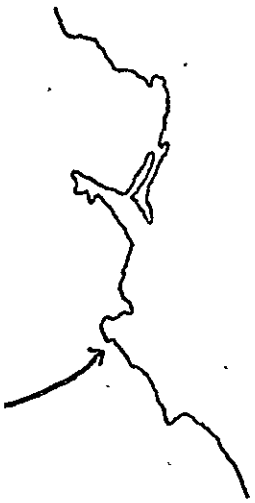
114.271W 29.780N

X = -230.821 Y = 1561.482

GROUND CONTROL ENTRY # 63

PUERTO SANTA TOMA

NORTHWEST BAJA



116.679W

31.550N

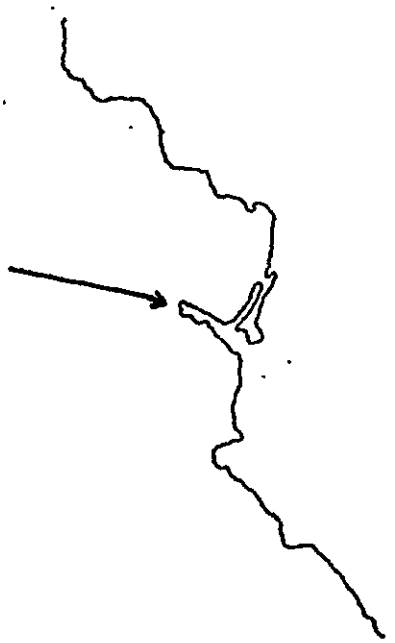
X = -518.779

Y = 1748.230

GROUND CONTROL ENTRY # 64

CABA PUNTA BANDA

NORTHWEST BAJA



116.731W

31.742N

X = -527.248

Y = 1771.554

GROUND CONTROL ENTRY # 65

PUERTO PENASCO.
IN UPPER GULF OF CALIFORNIA

113.636W

31.344N

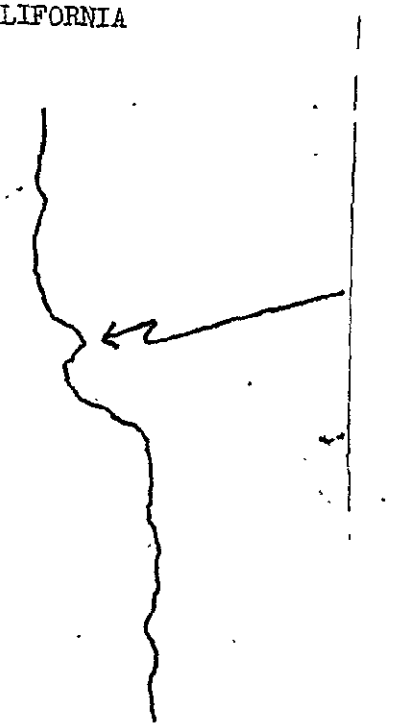
X = -189.929

Y = 1765.612

GROUND CONTROL ENTRY # 66

SAN FELIPE

IN UPPER GULF OF CALIFORNIA



114.809W

31.046N

X = -310.367

Y = 1711.016

GROUND CONTROL ENTRY # 67

ESCUINAPA RIVER, MOUTH

106.034W

22.817N

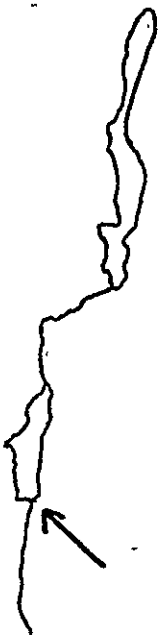
X = 827.108

Y = 858.733

GROUND CONTROL ENTRY # 68

CABALLO RESERVOIR

UPPER RIO GRANDE



107.287W

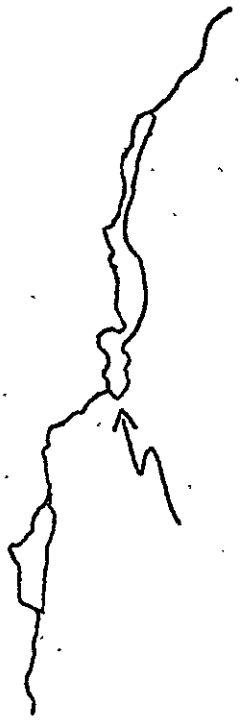
32.905N

X = 449.556

Y = 2071.538

GROUND CONTROL ENTRY # 69

ELEPHANT BUTTE RESERVOIR
UPPER RIO GRANDE



107.185W

33.152N

X = 454.393

Y = 2104.236

GROUND CONTROL ENTRY # 70

SIERRA BLANCA
NEAR RUIDOSO, NEW MEXICO

105.803W

33.373N

X = 593.140

Y = 2159.862

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